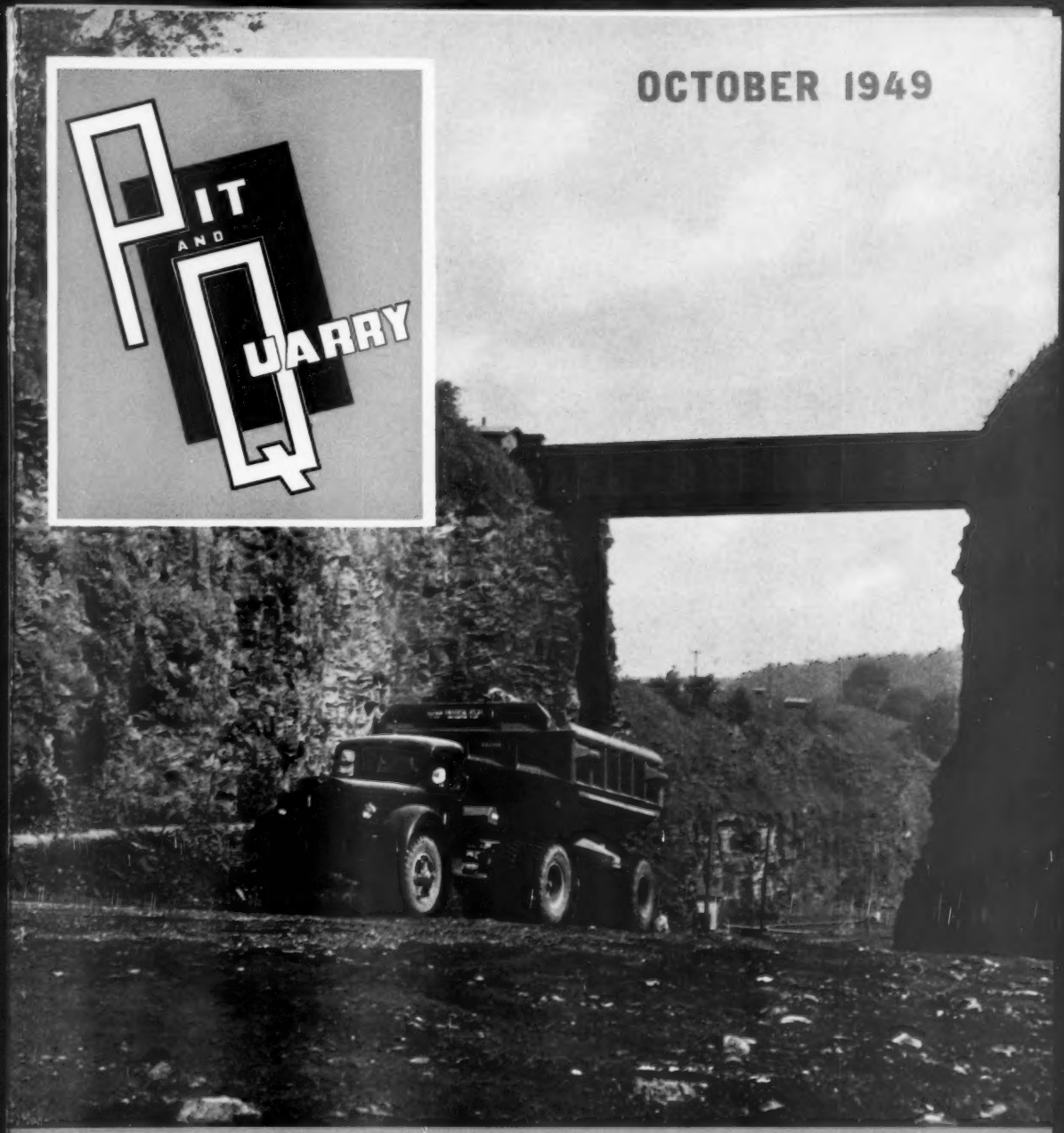
PIT AND QUARRY

OCTOBER 1949



Truck Hauling from Quarry of Universal Atlas Cement Co., Northampton, Pa.

In this Issue

Dust Collection Featured in Improved Cement and Crushed Stone Plants • New Feldspar Plant in Georgia • Stone Produced from Coal Mine Overburden • Corrosion Prevention

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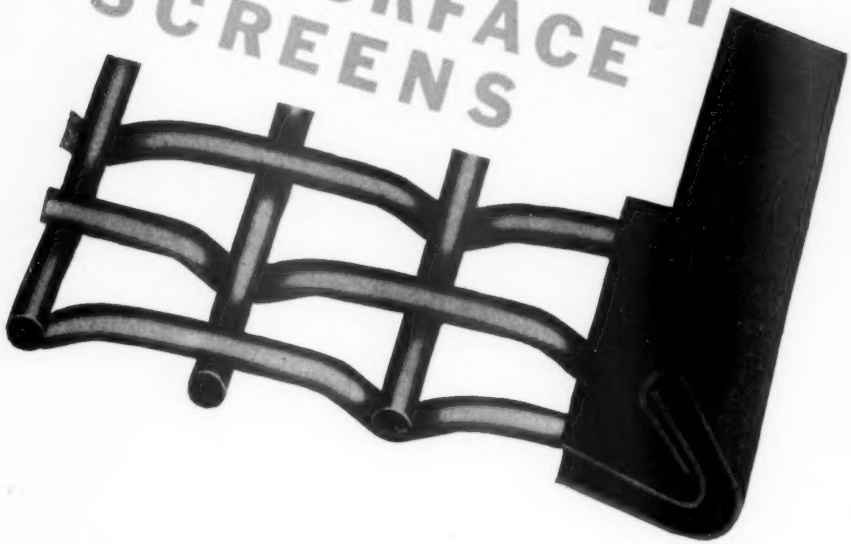
STA-SMOOTH EVEN-SURFACE SCREENS



Order Ludlow-Saylor *Engineered* Hook Strips for tensioning vibrator-screen decks. They transmit to every tensioned wire an equal share of uniform vibration, evenly distributed throughout the entire screen area. They make screen decks last longer—step up screen capacities—are easier to handle—quicker to install—need fewer adjustments and renewals.

The LUDLOW-SAYLOR WIRE CO.
610 S. Newstead Ave., St. Louis 10, Mo.

Send Catalog No. 90 on INDUSTRIAL SCREENS, WIRE CLOTH and WIRE FILTER FABRICS.

TO .....

FIRM .....

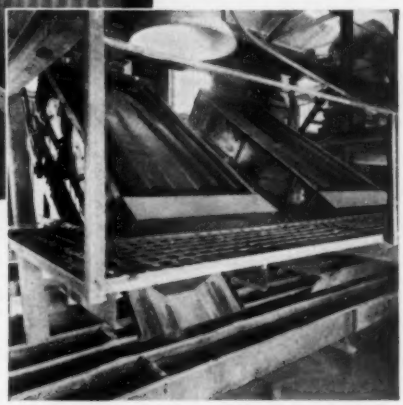
STREET .....

CITY-ZONE-STATE .....

LUDLOW SAYLOR

"Mechanized" by LINK-BELT

Below: Two of four Link-Belt vibrating screens which discharge into Link-Belt Helicoid conveyors.



Parallel Helicoid (screw) conveyors individually driven by Link-Belt worm gear drives, discharge onto 18 inch Link-Belt belt conveyor, in larger illustration.

For Better Handling, Screening and Blending of Refractory Clay

Link-Belt Conveyors, elevators and vibrating screens function as parts of a well coordinated, efficient preparation process in the newly expanded plant of Big Savage Refractories Corporation at Frostburg, Maryland. Link-Belt belt conveyors, screw conveyors and bucket elevators carry the clay through all stages of preparation and perform important blending operations. Ground and mixed clay passes over Link-Belt vibrating screens at two stages in the process. And Link-Belt enclosed gear drives give efficient transmission of power for all conveyors and screens.

Link-Belt engineering, guiding the selection, arrangement and installation of these numerous elements, produces exceptionally smooth operation, efficient performance, and economical production.

For complete conveyor systems or individual equipment, get Link-Belt recommendations first.

LINK-BELT COMPANY 11.548

Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Dallas 1, Houston 3, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8. Offices in Principal Cities.

Types of Link-Belt Conveying Machinery

Belt Conveyors	Apron Conveyors
Screw Conveyors	Oscillating Conveyors
Bulk-Flo Conveyors	Flight Conveyors
Chain Conveyors	Bucket Elevators
Trolley Conveyors	Bucket Carriers

LINK-BELT

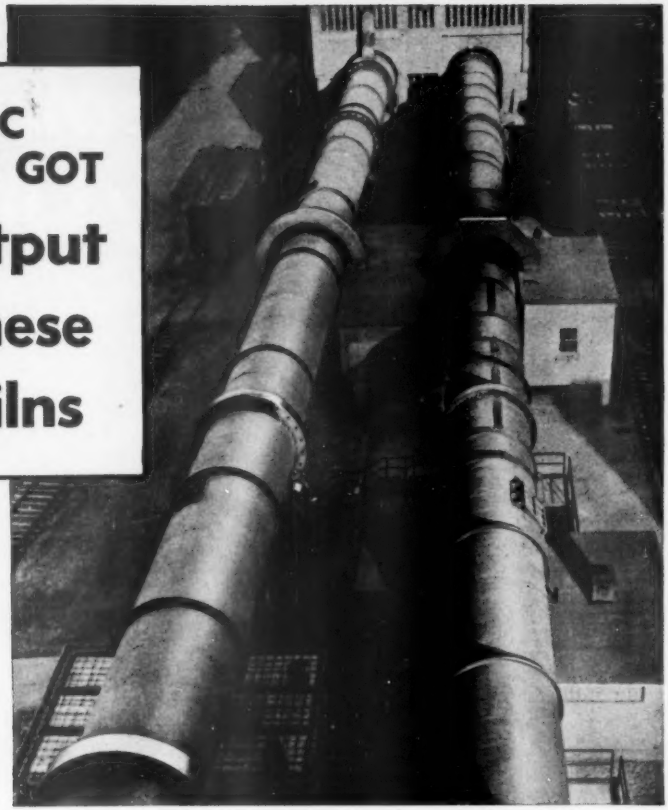
THE SYMBOL OF QUALITY — LINK-BELT

CONVEYING MACHINERY

"THE COMPLETE LINE"

PIT AND QUARRY, October, 1949. Vol. 42, No. 4. Published monthly by the Complete Service Publishing Company, 538 South Clark Street, Chicago 5, Ill. Subscription price $3 for 1 year in the U. S. and possessions, Canada, Central and South America; elsewhere $2 additional for each year. Single copy 25 cents. Entered as second-class matter February 28, 1932, at the Post Office at Chicago, Ill., under the Act of March 3, 1879.

HOW BASIC REFRACTORIES GOT Bigger Output —With These *Longer* Kilns



MAGNEFER, used in open hearth and electric furnaces as "fettling" refractory, is produced by Basic Refractories, Maple Grove, Ohio. Magnefer is made by dead-burning dolomite and iron ore flux to a temperature of approximately 3,000° F. in rotary kilns.

Like thousands of other companies, Basic Refractories was faced with the problem of stepping up production to meet a huge demand for their product.

A low-cost solution was found by making use of two existing short kilns at a great saving in first cost. These kilns were joined together and added-to (with a special section), making a 328 ft unit. The second kiln was then engineered and built by Allis-Chalmers to match the first.

Considerations of length, arrangement and the many other complex factors involved in a rotary kiln installation were worked out to obtain maximum economy as well as the desired capacity.

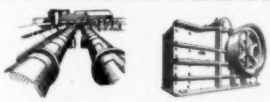
Result? Substantially increased production and a lower cost per ton than was possible with the shorter kilns.

CHECK A-C EXPERIENCE, FACILITIES

Whatever your burning process, it will pay you to consult Allis-Chalmers.

- A-C experience covers over 50 years of rotary kiln engineering.
- Hundreds of successful kilns installed.
- Allis-Chalmers shop and manufacturing facilities are unsurpassed.

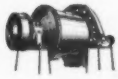
The Allis-Chalmers representative in your area is as close as your phone. Call him today, or write for Rotary Kiln **Bulletin 07B6368.** Offices or distributors in principal cities in the U.S.A. and throughout the world.



Kilns, Coolers, Dryers

Jaw Crushers

Hoists



Mills

Gyratory Crushers

Vibrating Screens

AND OTHER EQUIPMENT FOR THE CRUSHING, CEMENT AND MINING INDUSTRIES

A-2656

ALLIS-CHALMERS, 974A SO. 70 ST.
MILWAUKEE, WIS.

ALLIS-CHALMERS

Super-tough

for rough stuff

PIT and quarry truck operators will find it pays to BUY and SPECIFY Goodyear's Hard Rock Lug for their rigs. This extra-husky, extra-tough off-the-road tire is specially designed for premium performance on rock and other tire-punishing jobs.

Every feature of this outstanding work tire is job-tailored to give you longer tire life—lower cost-per-mile. The lug bars are massive to armor the tread and sidewall against cuts and rips—the undertread is extra-thick, extra-tough to protect the carcass against bruising—the tread design is universal, self-cleaning, to provide equal pulling power forward or reverse.

Try the super-tough Hard Rock Lug on your roughest runs. Find out for yourself why, *year after year, more tons are hauled on Goodyear tires than on any other kind.*

HARD ROCK RIB

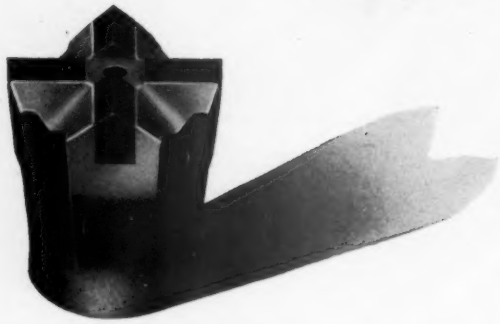
Companion tire for front wheels in pit and quarry work—easier steering, smooth rolling, same cord body, same shoulder and sidewall protection as Hard Rock Lug.

GOODYEAR

truck tires

Carset Jackbits

Reduce air consumption at least 40%
Reduce drill maintenance as much as 30%
Save up to 30% on dynamite



These and many more are the proved advantages of I-R CARSET JACKBITS

The performance and economy of Ingersoll-Rand's revolutionary CARSET JACKBIT are now a matter of record – proved by more than two years of actual field experience on all types of mining, quarrying and construction jobs.

This super-Jackbit set with Carboloy inserts, drills from 50 to 400 times as many feet of hole as the best steel bits available – with no appreciable gauge wear! It permits drilling of smaller, uniform-diameter holes to any practical depth, without binding and without bit changes. The elimination of tapered holes saves up to 30% on dynamite alone. And because it drills so much faster and easier, even in the hardest rock, the CARSET JACKBIT reduces air consumption per foot of hole 40% or more, and saves as much as 30% on drill maintenance. No wonder rock-drill men call it "The greatest single advance in rock drilling since the invention of the Jackhamer."

For the complete story on the CARSET JACKBIT, write today for your copy of our new 36-page, pocket-size catalog, Form 4091.

HERE ARE A FEW TYPICAL REPORTS ON CARSET PERFORMANCE

ON A LARGE QUARRY JOB, drilling in hard trap rock with 45-lb. Jackhamers, steel bits dulled so quickly that they required 4 to 6 bits for a 2-ft. change – also the strain of forcing dulled bits caused excessive rod breakage. CARSET JACKBITS, now being used, are averaging 300 feet per bit. Rod life has been greatly increased and drill maintenance materially reduced.

ON A LARGE DAM PROJECT, 2" CARSET JACKBITS were used with 4" Wagon drills operating in hard dense basalt. These bits drilled 24-ft. holes in 22 minutes, while steel bits previously used required 66 minutes for an 18-ft. hole (with 10 bit changes). Footage was increased from 120 to 261 feet per shift. The contractor says "If I'd had CARSET JACKBITS at the beginning of the job, I'd have saved $75,000 to $100,000."

IN DRILLING LARGE BOULDERS, for blasting in an open pit operation, Jackhamer operators increased drilling speed from 4 inches per minute with steel bits to 10 inches per minute with CARSET JACKBITS. This combination of higher drilling speed and the saving of time previously lost changing bits, permitted them to complete 60% more plug holes per day.

A MINING COMPANY, drove 223 feet of 8 x 8 cross-cut in typical siliceous rock with 3" drifters and 1½" CARSET JACKBITS. Eighteen bits were used, averaging over 300 feet per bit. By drilling small uniform diameter holes with CARSET JACKBITS, they saved 8 pounds of dynamite per foot of advance, or total of $223. – which more than paid for the cost of the CARSET JACKBITS!

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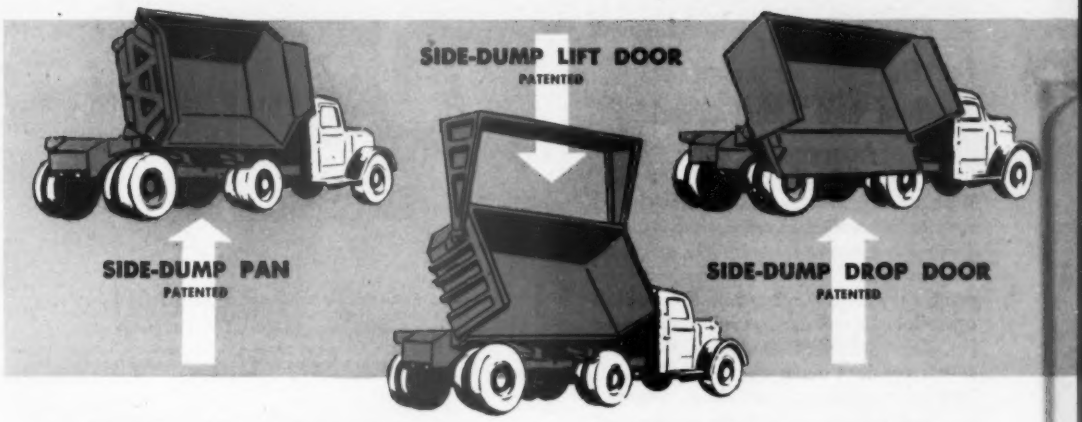
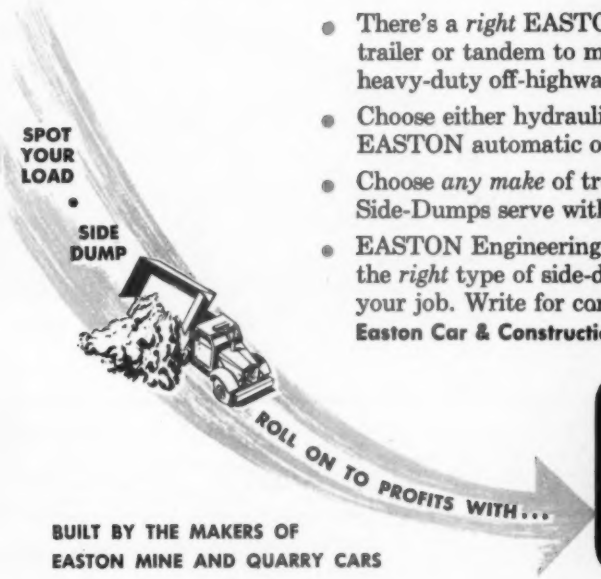
GO *SIDE-DUMP* WITH EASTON



SIDE-DUMP trailers, truck bodies, tandems for low-cost hauling of earth, rock and ore

- There's a *right* EASTON Side-Dump truck body, trailer or tandem to meet every requirement in heavy-duty off-highway service.
- Choose either hydraulic dumping, or dumping by EASTON automatic overhead hoist.
- Choose *any make* of truck tractor. EASTON Side-Dumps serve with all makes.
- EASTON Engineering Counsel assists in selecting the *right* type of side-dump, of the *right* capacity for your job. Write for complete information:

Easton Car & Construction Company of Easton, Pa.



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EASTON
Side-Dump
TRAILERS • TRUCK BODIES

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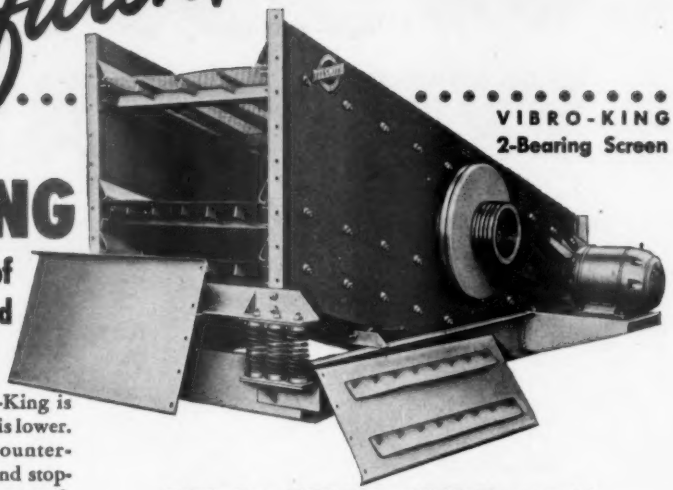
TELSMITH

more efficient screening

VIBRO-KING

For Finished Screening of Medium and Small Sized Aggregate

With its two bearings, the Vibro-King is simpler, more efficient, and upkeep is lower. Telsmith-patented automatic counterweights assure smooth starting and stopping as well as exceptionally smooth operation. Its circular screening movement is uniform everywhere on the screen cloth, and is constant under any load. Entire vibrating mechanism, including vibrating unit and screen cloth, floats on nests of springs. Welded and reinforced main frame is *horizontal* for rigidity and easy installation. Cable suspension, if desired. Five sizes, 1, 2, or 3 decks.



VIBRO-KING
2-Bearing Screen

Changing Screen Cloth is Simple and Quick—The upper end of the Vibro-King is readily removable, making it a much easier job to change screen cloth and saving a great deal of time.

Screen Cloth Mounting—At customer's option—screen cloth may be mounted in rubber on steel screen trays; or stretched over steel screen supports—protected by rubber—on any deck or decks.

SEND FOR BULLETIN 266

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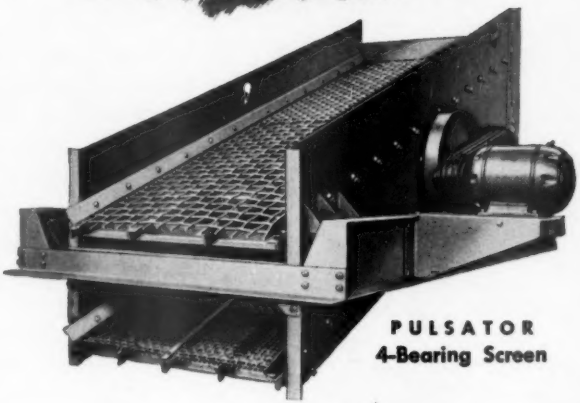
For Heavy-Duty Scalping

A four-bearing, heavy-duty vibrator . . . for all kinds of screening, especially scalping, or large sized aggregate . . . Pulsator's circular movement gives uniform, efficient screening on all decks and under heaviest loads. The best alloy steels, the finest antifriction bearings, protected by both labyrinth and piston ring seals, give longer life and lower upkeep. Eleven sizes, with 1, 2 or 3 decks.

V-3



PULSATOR
4-Bearing Screen

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Clyde Equipment Co., Portland 9, Ore., & Seattle 4, Wash. • General Machinery Co., Spokane 1, Wash. • Interstate Equipment Co., Statesville, N. C. • Rish Equipment Co., Charleston 22, & Clarksburg, W. Va.—Roanoke 7, & Richmond 10, Va. • Wilson-Weesner-Wilkinson Co., Knoxville 8, & Nashville 6, Tenn.

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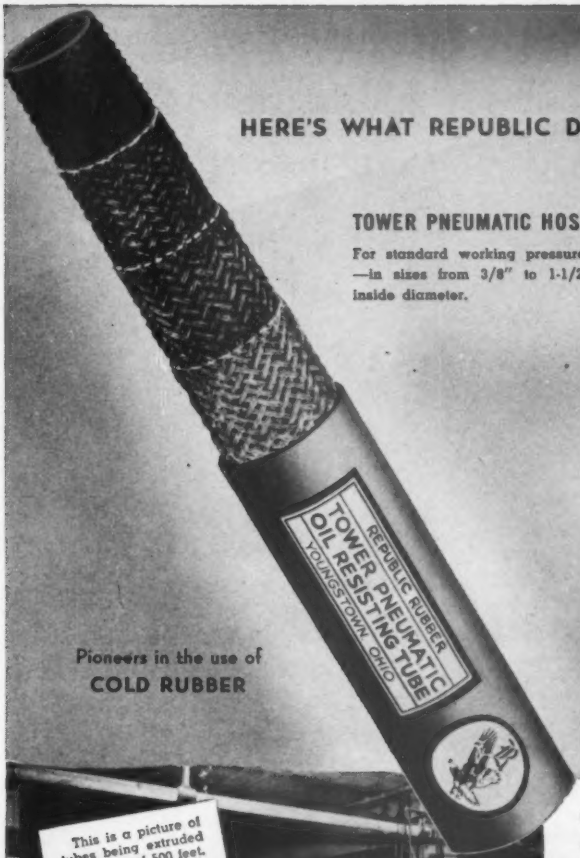

TOWER PNEUMATIC HOSE

For standard working pressures —in sizes from 3/8" to 1-1/2" inside diameter.

Mr. Richard Alcott, Vice Pres. and Gen. Mgr.
The Riechman-Crosby Co.
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Pioneers in the use of
COLD RUBBER

Eliminate Guesswork with TOWER HOSE for your pneumatic tools

"You can quickly recognize the high quality of Tower Pneumatic Hose," says Mr. Alcott, pictured above. Republic's strong braided cord plies, impregnated and imbedded in resilient rubber, provide a strong wall to withstand high pressures. As the hose is dragged from place to place a tough, resilient brown cover resists cutting, abrasion, and wear. The tube, specially designed, resists damages of heated oil from compressors. You will find Tower Pneumatic Hose on pneumatic tools in factories, foundries, railroads, shipyards, mines, quarries and on structural work throughout the world.

If you want long service Tower Hose, look in the classified section of your telephone directory for the Republic distributor's name, write or mail the coupon.

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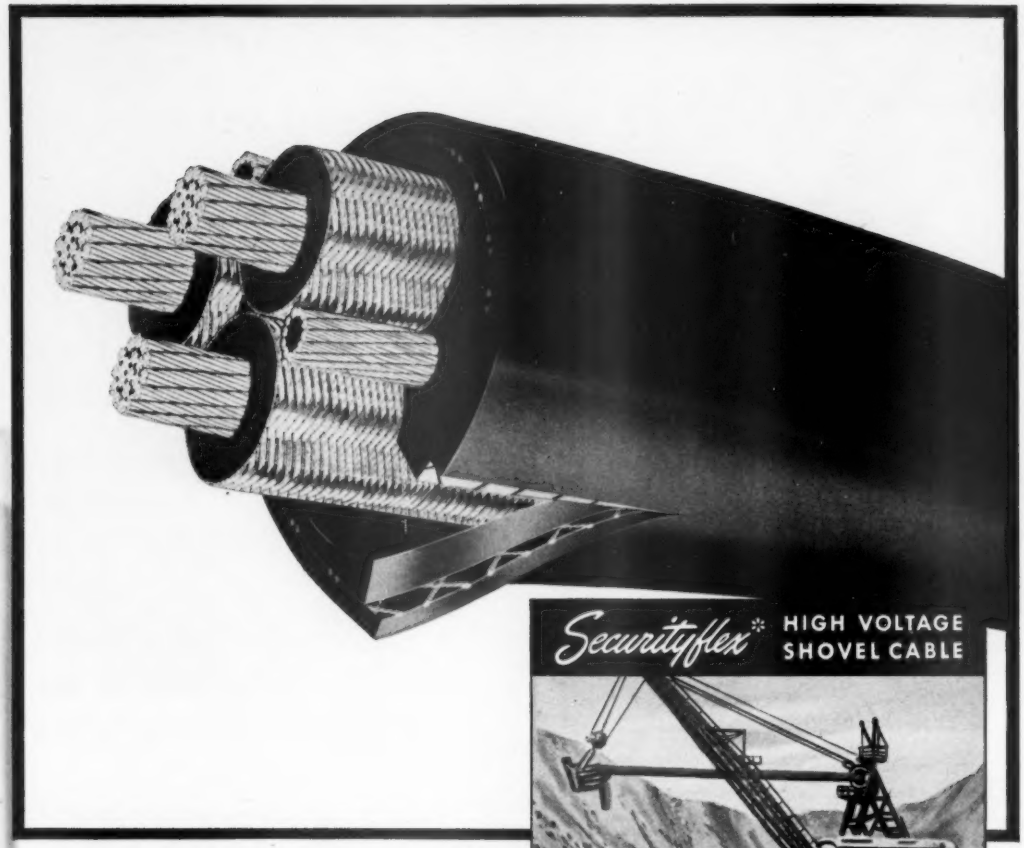

Engineered TO REDUCE DOWN-TIME

DON'T let costly electrified equipment be hampered by cable failures; invest in Securityflex High Voltage (Type SHD) Shovel Cable.

Patented grounding wires with neoprene cores are cushioned against shock, contact conductor shields at six points . . . revolutionary AB* insulation gives new resistance to corona discharge, moisture, is approved for 75° C . . . inner-belt-and-filler-combined conducts heat away for cooler operation under extreme overloads . . . new type conductor shields lie flatter, are easier to splice, can't chafe . . . extra rugged neoprene jacket resists flame and abrasion . . . cable won't kink. Here is a cable *engineered to reduce down-time.*

Write for Anaconda booklet DM 4822, which gives complete information on shovel cable. Anaconda Wire & Cable Company, 25 Broadway, New York 4, N. Y.

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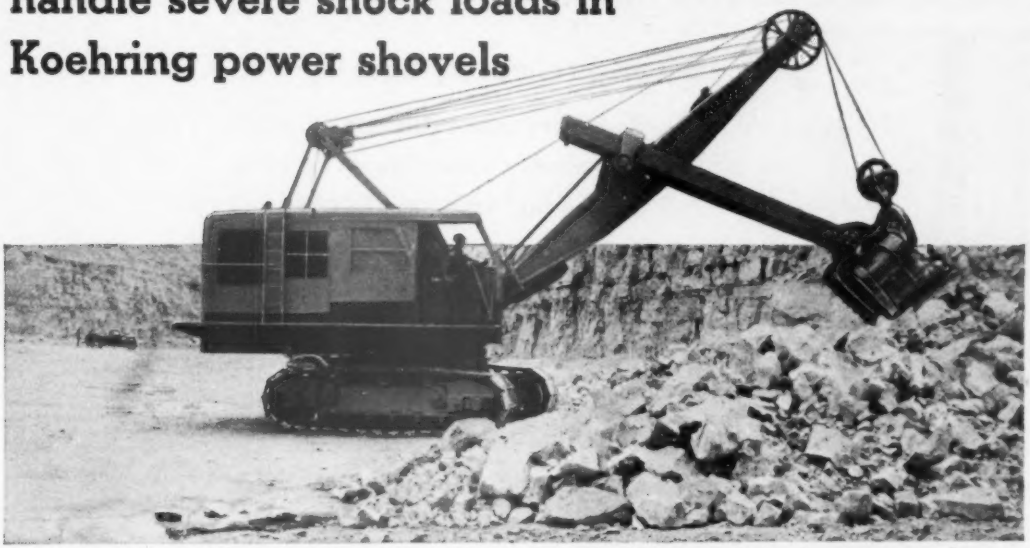
ANACONDA *Securityflex** **MINE CABLE**

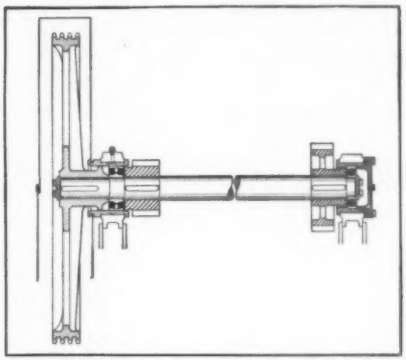
ANACONDA

*An Anaconda Trade-Mark

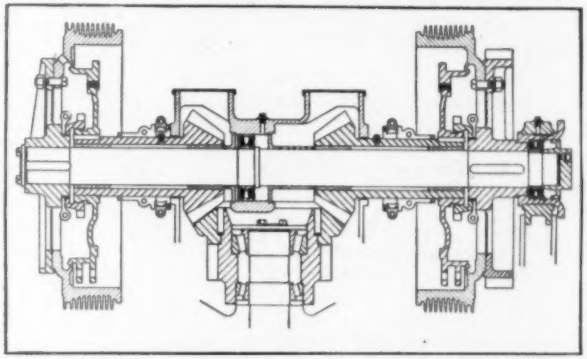
Torrington Spherical Roller Bearings handle severe shock loads in Koehring power shovels



Power Shovels made by Koehring Company, Milwaukee, are built to withstand the severe shocks and strains encountered in this rugged service. Among many advanced engineering features is the use of Torrington Spherical Roller Bearings on the swing and traction shaft and the countershaft. They compensate for deflection and prevent binding under shock loads.



Cross-Section of the countershaft shows how a Spherical Roller Bearing is used to maintain free-rolling alignment despite the overhung sheave and sudden stresses of operation. These heavy-duty bearings carry high loads with an ample margin of safety.



Two Spherical Roller Bearings are used on the horizontal swing and traction shaft. Here, too, the self-aligning feature is important, insuring accurate alignment of bearings spaced some distance apart. Because they carry thrust loads in either direction, these bearings also locate the shaft axially, preventing play and helping to minimize wear on bevel gears.

To power shovels, vibrating screens, hammer mills, rock crushers and other heavy-duty equipment, Torrington Spherical Roller Bearings bring operating advantages. Our engineers will gladly help you in adapting them to the machinery you make or use. Write us today. THE TORRINGTON COMPANY, South Bend 21, Ind., or Torrington, Conn. District offices and distributors in principal cities of United States and Canada.

TORRINGTON SPHERICAL ROLLER **BEARINGS**

Spherical Roller • Tapered Roller • Straight Roller Needle • Ball • Needle Rollers

IT COSTS LESS TO OWN THE BEST!

Stone Preheater, Soaking Pit & Deheater

Recovers and utilizes exit gases
Increases capacities up to 20%
Shows fuel savings of 40%

CONSIDER THESE FEATURES

MINIMUM MAINTENANCE

- *No moving parts*
- *Practically NO maintenance*
- *Eliminates all overburning or underburning*
- *Quick adjustment and ease of control*
- *Decreases ring formation*
- *Heat radiation loss held to minimum*
- *Uniform operation, all stone receives same treatment*

The use of a KVS Preheater, Soaking Pit and Deheater on a rotary lime kiln provides an ideal combination that reduces cost and maintenance, increases production, improves quality.

Tests first proved the value of this method during the war years. Figures supplied by responsible users, NOW show even more satisfactory results, made possible through KVS advanced engineering.

If you are interested in an installation that will earn extra profits for YOU, year-in, year-out, investigate the advantages of this scientific, labor-saving, money-making lime production equipment.

Let a KVS engineer demonstrate how this preheater can be utilized on a short kiln. We can help you reduce costs, increase production, add to your profits and prove that it "Costs Less to Own the Best."

Send for bulletin describing, fully, KVS Lime production equipment

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TWO PARK AVENUE, NEW YORK 16, N. Y.

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Industrial Engines and Power Units

HORSEPOWER WITH A PEDIGREE

● In the past 25 years, Chrysler Engineers have pioneered, developed or introduced a greater number of noteworthy Engineering and Design Features for gasoline engines than any other manufacturer.

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- **Rotor Type Oil Pump**
- **By-Pass Thermostat for Cooling System**
- **Full Flow Oil Filter**
- **Wide-gap Resistor Spark Plugs**

And along with leadership in Engineering and Design has come leadership in Service through a highly developed world-wide service organization. ***Industrial Engine Division, The Chrysler Corporation, 12200 East Jefferson Avenue, Detroit 31, Michigan.***

Choose from America's

most complete line of trucks

for these 4 reasons

1 **International Trucks are specialized** for the job. International builds America's most complete line of trucks. It offers 22 basic models, 1,000 truck combinations ranging in gross vehicle weights from 4,400 to 90,000 pounds. It also offers 13 truck engines (gasoline, diesel, butane) as well as specialized units and parts, to satisfy individual hauling requirements. An International sales engineer who knows your business in terms of trucks helps you analyze your own hauling needs and select the right International Trucks to meet them.

2 **For the 17th straight year** International Trucks lead in heavy-duty sales. The country's most exacting truck buyers are the men who buy trucks of 16,001 pounds GVW and over. Their vote of confidence in Internationals is based on truck value—the same truck value found in every International . . . light, medium, and heavy-duty.

3 **More than half of all International Trucks** ever built—in 42 years—are still at work. International has been building rugged trucks uncompromised by passenger car design or construction since 1907. International Trucks are built to last—and they do.

4 **International Trucks are backed** by America's largest exclusive truck service organization. 4,700 Dealers and 170 Company-owned Branches offer complete International Truck service wherever you drive a truck. Precision-engineered replacement parts, factory-rebuilt exchange units, and factory-trained mechanics are as close as your telephone. For the right truck to solve your hauling problems, see your nearest International Dealer or Branch.

International Harvester Builds McCormick Farm Equipment and Farmall Tractors . . . Motor Trucks . . . Industrial Power . . . Refrigerators and Freezers

Tune in James Melton and "Harvest of Stars," NBC, Sunday afternoons

INTERNATIONAL TRUCKS

INTERNATIONAL HARVESTER COMPANY · CHICAGO

You're in Control...

WHEN YOU PROCESS WITH

Traylor Rotary Kilns

ALL NECESSARY switches and gauges . . . kiln speed regulator . . . heat and atmosphere controls . . . are centralized at one convenient location on a Traylor Kiln. Every phase of high temperature thermo-processing is continuously under the operator's observation and control.

The central control station of a Traylor Rotary Kiln is a feature as important as the exactness of its design and assembly—rigid, all-welded steel shell—cut steel driving gear—floating-type riding rings—improved supports and individual planning and construction.

Write today for full details of Traylor Rotary Kilns.

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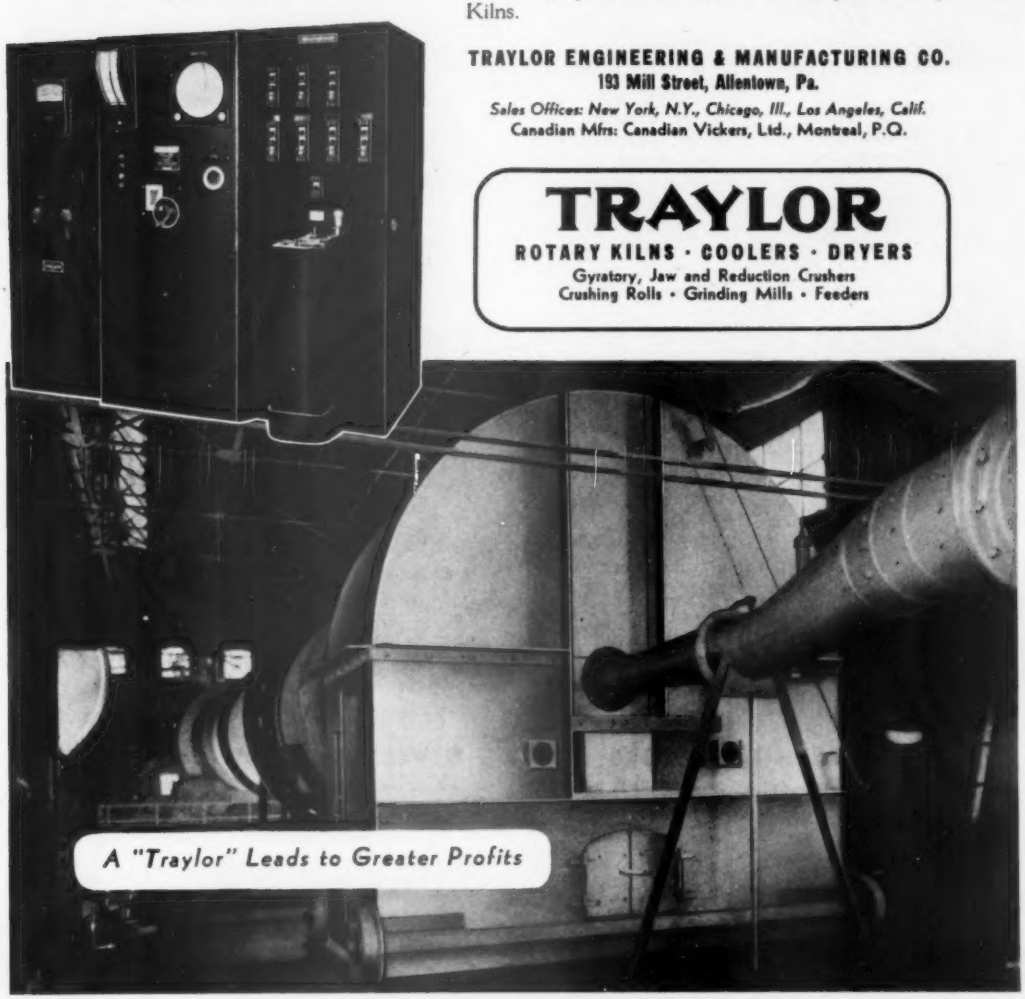
TRAYLOR
ROTARY KILNS · COOLERS · DRYERS
Gyratory, Jaw and Reduction Crushers
Crushing Rolls · Grinding Mills · Feeders



Facts you should know

about the New General Motors Diesel Engine-Torque Converter Unit

Two 190 H.P. 6-Cylinder GM Diesel Engine-Torque Converter units power the new 34-ton Euclid 1-FFD tandem axle rear-dump. Each engine drives one rear axle, eliminating the conventional inter-axle power divider. A 3-speed Allison Torqmatic transmission does away with the clutch pedal and manual shifting. Designed for off-the-highway haulage of large tonnage, the mammoth 1-FFD has a top speed of 25.4 m.p.h. with full pay load.

ONE MANUFACTURER ONE RESPONSIBILITY The new torque converter is specifically designed and manufactured by General Motors as an integral unit with the Series 71 two-cycle Diesel engine. Result: a big saving in size and weight—no compromise designs—no divided responsibility.

AUTOMATIC SHIFT FROM TORQUE MULTIPLICATION TO FLUID COUPLING Desirable features and advantages of *both* torque converter and fluid coupling are combined in this converter. Continuous *automatic* transition from 3.6-to-1 torque ratio at stall speed to 1-to-1 torque ratio in fluid coupling. Unit goes into fluid coupling whenever load requirements equal engine torque, without regard to output shaft speed.

MORE WORK IN LESS TIME This new power unit gets the most work done in the least time. Because it is not rigidly geared to the load, the engine responds to the throttle and immediately accelerates to a high output range regardless of the speed of the load.

FREEDOM FROM SHOCK LOADS Transmission of power through a liquid, cushions both engine and driven machinery from sudden shock loads. Operation is liquid-smooth (free from jerks) at any speed or throttle setting.

FREEDOM FROM STALLS WITH OVERLOAD Fluid circuit prevents engine stalling under any load condition. Ability to exert a smooth pull at any output shaft speed down to zero permits GM Converter-equipped machines to do some operations that are impossible with conventional units.

EASE OF HANDLING Eliminates time lost in unnecessary low gear operation. Operator fatigue is reduced. Work is speeded up with less effort on the part of the operator.

WIDE RANGE OF MODELS The new GM Diesel Engine-Torque Converter unit is made available in 3-, 4- and 6-cylinder single engine units, Twin 4 and Twin 6 multiple engine units with engine ratings from 64 to 294 B.H.P. to meet a wide range of power requirements. *Write or wire for full details.*

DETROIT DIESEL ENGINE DIVISION

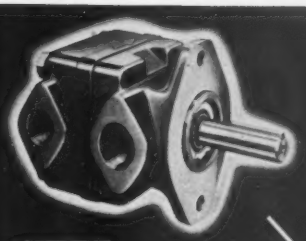
SINGLE ENGINES... *Up to 200 H.P.* **DETROIT 28, MICHIGAN** MULTIPLE UNITS... *Up to 800 H.P.*

GENERAL MOTORS

DIESEL BRAWN WITHOUT THE BULK

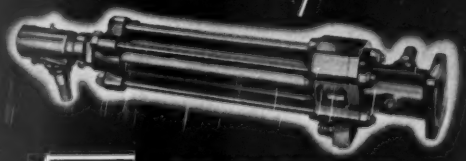
GM GENERAL MOTORS DIESEL POWER

VICKERS Hydraulic Steering System COSTS YOU 20% Less THAN PREWAR



VICKERS SERIES V-200
BALANCED VANE PUMP
See Bulletin 49-52

At the current low prices, your new models should offer the added sales advantages made possible by VICKERS Steering System



VICKERS HYDRAULIC STEERING **BOOSTER** with integral overload relief valve . . . *See Bulletin 47-30a*

Improved design, better tooling and production methods of the past 10 years have resulted in a more than 20% price reduction in the Vickers Hydraulic Power Steering System. This saving greatly broadens the application possibilities of the Vickers Steering System.

Important among the many advantages of the Vickers Steering System are safety, effortless steering, adaptability and operator satisfaction. The resulting substantial customer acceptance and preference for Vickers Hydraulic Power Steering System is evident from its specification as original equipment by an increasing number of mobile equipment builders and operators alike.

3987

VICKERS Incorporated

DIVISION OF THE SPERRY CORPORATION

1598 OAKMAN BLVD. • DETROIT 32, MICHIGAN

Application Engineering Offices:

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from design to delivery-

BETTER MULTIWALL BAGS

LOWER HANDLING COSTS

BAGPAK DIVISION

INTERNATIONAL PAPER COMPANY, Bagpak Division
220 EAST 42nd ST., NEW YORK 17, N. Y.

BRANCH OFFICES: Atlanta, Baltimore, Boston, Chicago, Cleveland, Baxter Springs, Kansas, Los Angeles, New Orleans, Philadelphia, Pittsburgh, St. Louis, San Francisco.

In Canada: Continental Paper Products, Ltd., Montreal, Ottawa

From the original designing of the many varieties of Bagpak Multiwall Bags, through manufacturing *to final delivery*, Bagpak engineers are alert to new and better ways to minimize *your* costs — increase *your* packaging efficiency.

Palletized shipments of Bagpak bags lower handling costs for you — a typical example of how Bagpak engineers work as your "partners in packaging".

Let Bagpak — manufacturers of multiwall bags and bag packing machinery — put its broad experience at your disposal.

WICKWIRE ROPE

A PRODUCT OF CF&I

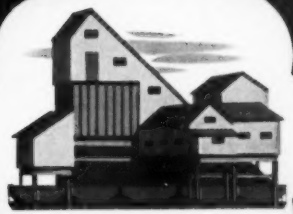
Ask any user . . . you'll find them everywhere

In scores of industries, users of Wickwire Rope have developed an affectionate respect for its performance, safety and long life. And, for true economy, they use Wickwire's WISSCOLAY® *Pre*formed. It lasts longer — is easier to cut, splice and install. It's kink-resistant and safer to handle. Wickwire Distributors and Rope Engineers, in key cities everywhere, are prepared to render prompt service in meeting your wire rope needs. Wickwire Rope Sales Office and Plant — Palmer, Mass.

IN THE EAST—Wickwire Spencer Steel Div. of C. F. &I.
500 Fifth Ave., New York 18, N. Y.
IN THE ROCKIES—The Colorado Fuel and Iron Corp.
Continental Oil Bldg., Denver, Colo.
ON THE WEST COAST—The California Wire Cloth Corp.
1080—19th Ave., Oakland 6, Cal.

LOGGING

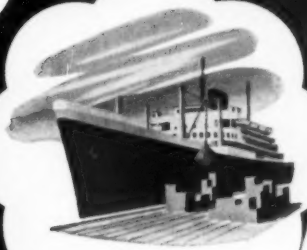
TRANSPORTATION



MINING

PETROLEUM

MANUFACTURING



MARINE

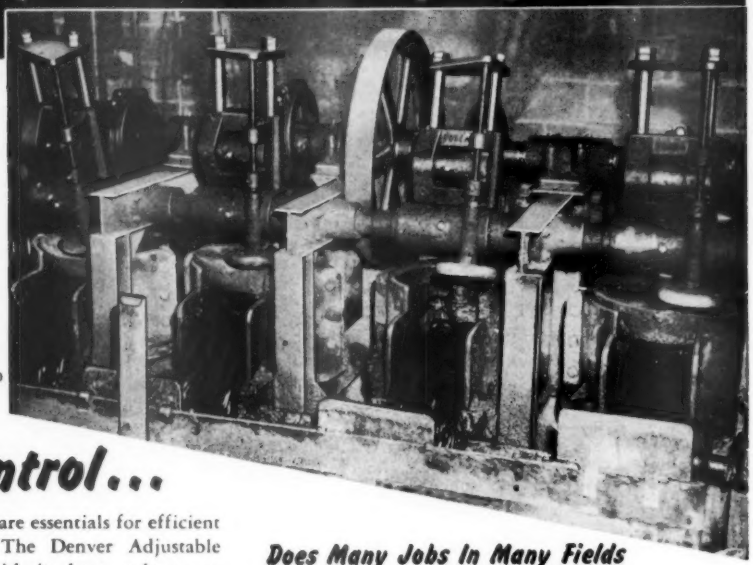
CONSTRUCTION

A. E. Bostman

Control Large Volumes of Pulp

WITH A

Denver *Adjustable Stroke* Diaphragm Pump



This 6" Quadruplex Denver Adjustable Stroke Diaphragm Pump is doing a real job at the Tamaqua Colliery of the Lehigh Navigation Coal Company, Inc.

Material...Minus 6 mesh washery refuse (Underflow from 75' diameter Denver Hydroclassifier)

% solids in pulp...35-45
Gallons pulp per min....600
Tons solids per 24 hrs....1450-2000

Density Control...

...and pulp flow regulation are essentials for efficient industrial plant operation. The Denver Adjustable Stroke Diaphragm Pump, with its large volume capacity, ease of control, and rugged, long wearing construction, is an ideal unit for heavy duty "24-hour service."

Hand Wheel Controls Pulp While Pump is Running

Simply turning the adjustable hand wheel changes the length of stroke and immediately alters the pulp flow to the required amount, *while the pump is operating.*

Rugged Construction Gives Long Life And "24-Hour Service"

The Denver Adjustable Stroke Diaphragm Pump is sturdily built to give trouble-free service. Molded rubber valve seats and diaphragms are long wearing and may be quickly replaced with a minimum of shutdown time.

Does Many Jobs In Many Fields

In coal washing...in copper, phosphate, potash and other concentrators...and in industrial plants... large volumes of pulp are being handled "24 hours per day," month after month with these heavy duty Denver pumps.

Wide Range of Sizes, Large or Small Capacities

Sizes range from 2" to 6" in Simplex, Duplex, Triplex or Quadruplex units.

A 6" Quadruplex Pump, handling 60% solids at 4.2 specific gravity, has a rated capacity of 3,140 tons per 24 hours. A 2" Simplex Pump under similar conditions has a rated capacity of 80 tons per 24 hours.

Let us help you solve your pumping problems. Write today for Bulletin P8-B for additional information on the Denver Adjustable Stroke Diaphragm Pump. Other bulletins also available on a complete line of ore dressing equipment.

DENVER EQUIPMENT 24 HOUR SERVICE COMPANY

"The firm that makes its friends happier, healthier and wealthier"

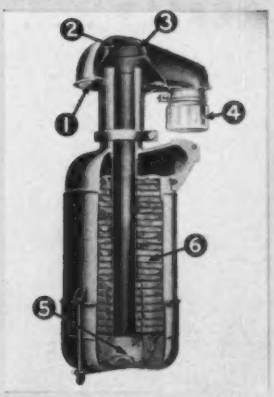
DENVER EQUIPMENT COMPANY

1408 17TH STREET • DENVER 17, COLORADO

DENVER • NEW YORK CITY • CHICAGO • EL PASO • TORONTO • VANCOUVER • MEXICO CITY • LONDON • JOHANNESBURG • RICHMOND, AUSTRALIA

DEPENDABLE POWER

in clouds of dust!



"Caterpillar" Advanced Design
• Oil Bath Air Cleaner

Here's real protection for the engine against dust. A pre-cleaner (1) removes large particles of foreign material and by giving a whirling motion to the air (2 and 3) throws out a high percentage of small particles (4). The air passes through a central tube to the bottom of the cleaner (5). It then rises up through the outer portion of the air cleaner and, as it does so, is washed on a series of oil-bathed wire screens (6). Air passing through "Cat" air cleaners is free of dust, thereby helping owners realize long trouble-free engine life.

(Price of a D13000 Power Unit with open clutch is $5949 f.o.b. Peoria, Illinois, subject to change without notice)

Rock-crusher engines are usually operated in severe dust conditions. Such conditions are mighty tough—so tough, engine seals and air cleaners must do double duty. Powering rock crushers all over the world, "Cat" Diesel Engines have proved their ability again and again to stand up under the most punishing treatment. And the two D13000s and the D8800 working for M. M. Beard of Knoxville, Iowa, are no exception.

Operating 10 hours daily, 25 days a month, these rugged "Cat" Diesels power a "Cedarapids" jaw crusher and a Gruendler hammermill. Rock output averages 700 to 800 tons per day. "Our condition is as rough as you can get—wet limestone is tough," Foreman Asa Marshall comments. "Our 'Cat' Engines are doing a swell job for us."

Besides these three engines, M. M. Beard owns a "Cat" Electric Set and "Caterpillar" RD6 track-type Tractor. Maintenance and parts service is excellent—the kind that is counted on, when and where needed, from the nearby, well-equipped "Caterpillar" dealer. Let your "Caterpillar" dealer give you job-proved facts and figures on the dependable, low-cost performance of "Cat" Engines. He's as close as your phone—call him today.

CATERPILLAR TRACTOR CO., PEORIA, ILLINOIS

CATERPILLAR

REG. U. S. PAT. OFF.

DIESEL ENGINES • TRACTORS
MOTOR GRADERS
EARTHMOVING EQUIPMENT

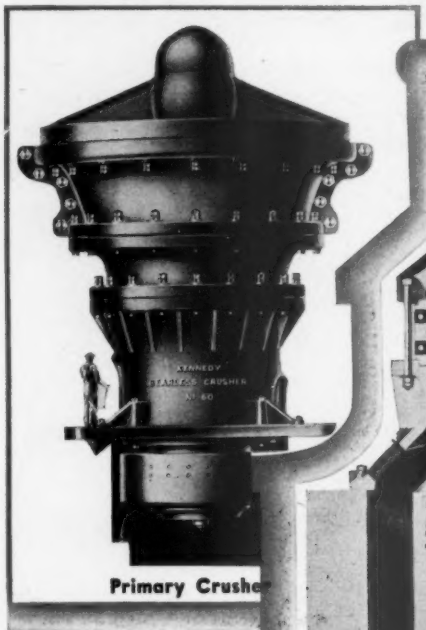
CATERPILLAR TRACTOR CO.
Box PQ-10, Peoria, Ill.
Send me, without obligation, booklet: "The Right Combination for Crushing."

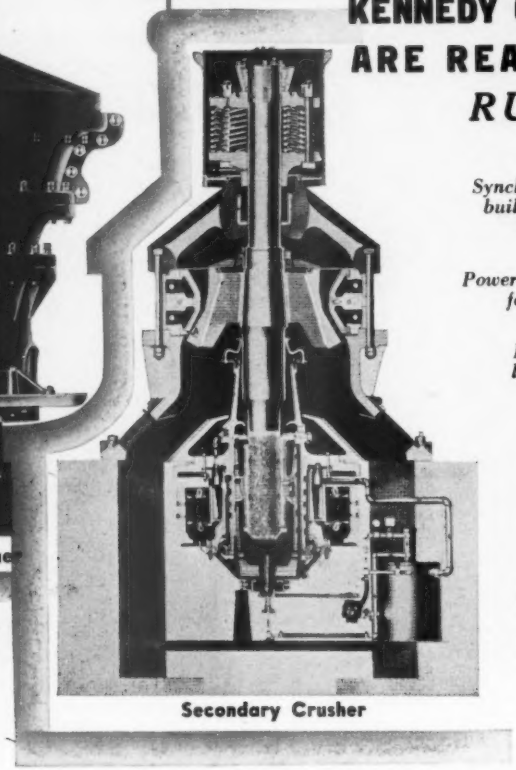
Name _____

Address _____

City _____ State _____

IT COSTS LESS TO OWN THE BEST!





ROLLER BEARING
GEARLESS, GYRATORY
CRUSHERS

KENNEDY CRUSHERS ARE REALLY . . . *RUGGED!*

Synchronous motor built into pulley assembly

●

Power applied ONLY for crushing

●

Force-feed lubrication

●

No gears to waste power

●

Added power at no added cost

●

Quiet — smooth Frictionless action

●

Varying capacities to serve every purpose

Designed and built to produce, economically and consistently, maximum loads of uniform products. Assures efficient service with minimum "time off for repairs" under the most severe operating conditions.

Costs less in the long run because it has a larger capacity; uses less power; holds repair bills to a minimum; produces more and better rock tonnage, faster and at lower cost.

Kennedy Crushers are made in various size units delivering from 12 to 3600 tons per hour. Engineered to serve your exact needs. Fifty years experience in the building of heavy duty crushers is your assurance that "It Costs Less To Own The Best" when you use KVS equipment.

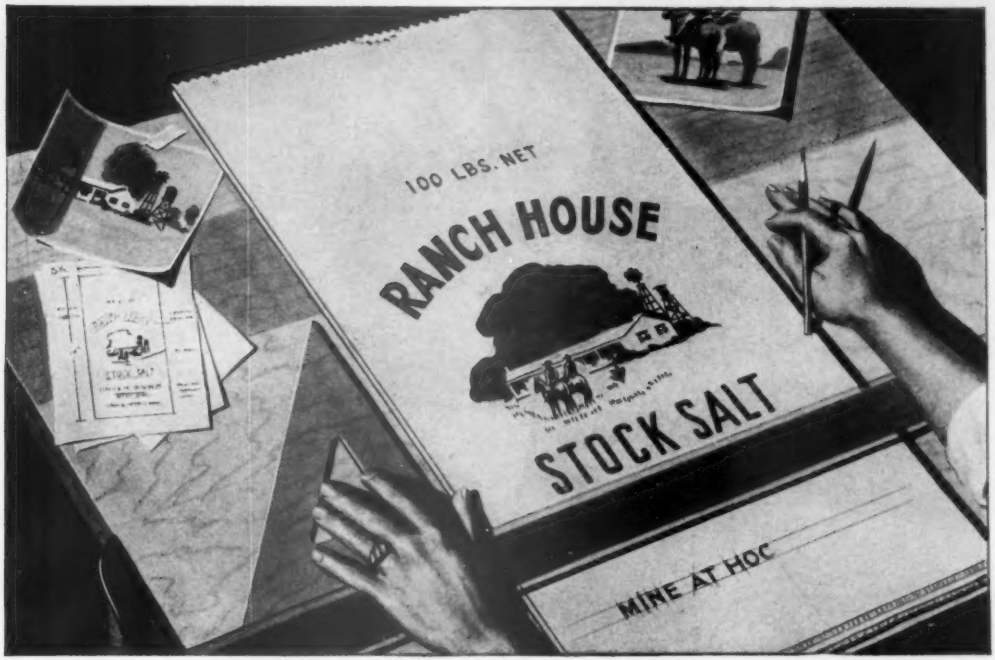
Send for bulletins describing, fully, all types of KVS crushers

KENNEDY-VAN SAUN MFG. & ENG. CORPORATION
TWO PARK AVENUE, NEW YORK 16, N. Y.

Your

Union Multiwall Specialist

knows how to make your package do a selling job



UNION package designers can transform the fine printing surface of a Multiwall Bag into a compelling advertisement for your product at the point of sale—where advertising really pays off! Your brand name and trademark, exclusive features, formulations and instructions for use—all can be presented with color and drama to help make your product sell.

That Union package designing *really sells* has been proved year after year in the sales records of many companies—and repeatedly proved in national packaging competition.

This packaging experience is yours to command, through your Union Multiwall representative. Use it!

★ ★ ★

SPECIAL NOTE TO USERS OF OTHER TYPES OF PACKAGING

Companies making over 300 different products have cut packaging and handling costs by switching to Union Multiwall Bags.

When your Union Multiwall representative calls let him analyze your entire packaging problem to see what savings you can effect!

Multiple Protection

Opens Easily

Prevents Siftage

Empties Clean

TRADE MARK
UNION

UNION Multiwall Bags

UNION BAG & PAPER CORPORATION

233 BROADWAY, NEW YORK 7, NEW YORK

Offices In: CHICAGO, ILL. • NEW ORLEANS, LA. • MINNEAPOLIS, MINN. • KANSAS CITY, MO. • HOUSTON, TEXAS

POWER PACKED

For Big Pit Performance

This T7 TRAXCAVATOR is digging and loading terra-cotta clay in the pit of the Washington Brick and Lime Company, Spokane, Washington.

It's tough work — but TRAXCAVATORS have the digging power and bite to scoop up big heaping buckets of hard clay or shifty sand and load it into trucks or mixers . . . day after day without let up.

Their versatility makes them doubly profitable. They strip overburden, dig, load trucks, stockpile, build roads. Put a TRAXCAVATOR in your pit and watch your output increase and your profits go up.

For full information on these versatile machines, see your TRACKSON-"Caterpillar" dealer today or write direct to the TRACKSON COMPANY, Dept. PQ-109, Milwaukee 1, Wisconsin.

TRAXCAVATOR

REG. U. S. PAT. OFF.

The Original Tractor Excavator

55 HORSEPOWER

Runs 2 Kue-Ken Crushers*

Produces 40 tons per hour of hard rock to minus ¾". *Only* 55 H. P. runs both crushers!

On the installation shown in picture (firm name on request) a No. 70 Kue-Ken Simplex Jaw Crusher with 30" x 15" opening receives truck loads of extremely hard granite boulders. These are crushed to minus 2½ inches. Crusher discharges onto vibrating screen with ¾" openings. Minus ¾" screen product by-passes 18" Kue-Ken gyratory and goes direct to stock pile.

Plus ¾" rock from screen is delivered to Kue-Ken gyratory crusher without a feeder. Gyratory crusher converts rock to minus ¾".

This customer expresses gratification at the low power consumption, as the firm generates its own power and all fuel must be hauled 8 to 10 miles. They also report a full year's operation without a single replacement of jaw plates or any other part.

KUE-KEN GYRATORY

Operates on the long-proved Kue-Ken principle of "crushing without rubbing." Powerful, compact, yet with larger, stronger shafts —7" dia. in 18-inch crusher, which provides greater bearing area for cool-running, longer life. LOW HEADROOM—18-inch crusher only 30¼" high, TAKES CHOKE FEED of hardest rock—no feeders required. Other exclusive Kue-Ken features described at left. Sizes, 18" and 3 ft. at present time.

KUE-KEN JAW CRUSHER

Pictured is No. 70, 30" x 15". Perfect lubrication of all mechanism in oil-tight housing stops wear, requires attention only twice a year. Automatic features give complete protection against lubrication failure and overloading. A miser for power, a giant for production. All-steel frame is three times stronger than cast iron, weighs only half as much. Can be choke-fed—flood it with rocks and keep it full. Other sizes from 12" x 7" to 42" x 25".

These Features SAVE You Money

LONGER LIFE. Kue-Ken jaw plates wear 5 to 10 times longer because fast-wearing rubbing and abrasive action is eliminated. Saves costly replacements.

LIGHTER WEIGHT, HIGHER SPEED. Exclusive Kue-Ken design permits 30-40% saving in crusher weight, 50-60% higher crushing speed. Kue-Ken Crushers have greater capacity, turn out bigger volume and more uniform product with less power.

OVERHEATING ELIMINATED. Larger, heavier, stronger shafts with greater bearing surface reduces bearing pressure and wear. Bearings are sealed in filtered oil and pump-lubricated. Result: Complete protection from dirt and abrasive, a crusher with long life at full-speed production.

AUTOMATIC PROTECTION. Kue-Ken Crushers are equipped with built-in automatic release, insurance against expensive shut-downs due to tramp iron or overloading. An automatic cut-off is also provided, which stops crusher instantly in case of lubrication failure.

MORE PRODUCTION WITH LESS POWER. Kue-Ken Crushers using the exclusive Kue-Ken principle of "crushing without rubbing" give 2 to 3 times greater capacity than old-style crushers with less horsepower, substantially reducing operating cost.

GET THE FACTS. Write today for Gyratory Bulletin 604 or Jaw Crusher Bulletin 605.

Exclusive manufacturer for Eastern U.S., Canada and Puerto Rico: Pennsylvania Crusher Co., Broad and Arch Sts., Phila., Pa.

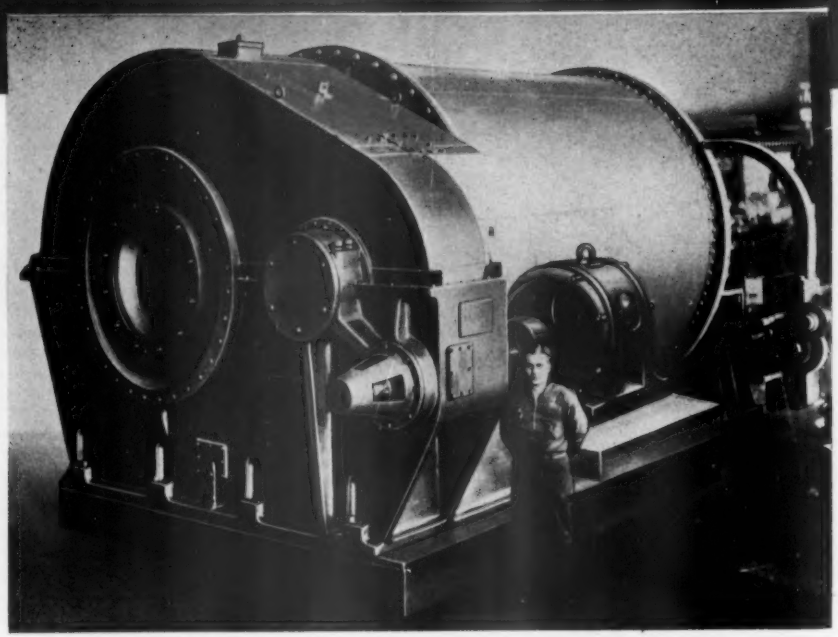
*Pronounced Que-Ken. U. S. and Foreign Patents Pending

STRAUB MFG. CO.

545 Chestnut St. Oakland 20, California

Kue-Ken Balanced Crushers	Rib Cone Ball Mills	Overflow Classifiers
Kue-Ken Simplex Crushers	Concentrating Tables	Feeders
Kue-Ken Gyratory Crushers	Overhead Eccentric Crushers	Screenwheel Classifiers

IT COSTS LESS TO OWN THE BEST!



KENNEDY INTEGRAL GEAR DRIVE AIR SWEPT TUBE MILL . . .

BUILT-IN FEATURES OF KVS BALL MILLS

Integral Gear Drive connected directly to driving shaft

•

Shaft carried in roller bearings. Cannot be misaligned or set wrong

•

All Gears and Bearings automatically oil sprayed

•

Requires less power to drive

•

Mesh sizes readily adjusted

KVS Tube and Ball Mills are versatile. They can be used as a rod mill, tube mill for wet or dry grinding or for air sweeping. Built to LAST, they provide trouble-free service year-in, year-out.

Our records show that in 15 years no gears or pinions have ever worn out. Compare this service record with any other mill . . . judge for yourself the quality of materials and workmanship which goes into these fine machines.

Made in any length or diameter required according to YOUR needs and OUR rigid specifications. The experience of over fifty years is applied in building a mill that will provide maximum service at continued low operating cost.

Replace your obsolete equipment with mills that will quickly pay for themselves out of increased earning capacity. Long life assures liberal dividends from the investment and, when you specify KVS equipment "It Costs Less To Own The Best."

Send for bulletin describing, fully, all types of KVS mills

KENNEDY-VAN SAUN MFG. & ENG. CORPORATION

TWO PARK AVENUE, NEW YORK 16, N. Y.

All-weather protection *with* GULF LUBRICANTS

helps contractor get better equipment performance on tough stripping job . . .

Sager Construction Company, St. Louis, Mo., recently completed the contract to move 800,000 yards of overburden from this clay mine owned by Kentucky-Tennessee Clay Company, Mayfield, Kentucky.

"WE operated during all seasons of the year on this job, so we had to use petroleum products that would keep equipment rolling in spite of big temperature variations," says Troas Joiner, Superintendent of the Sager Construction Company. "Hot or cold, mud or dust, we've had top-notch performance from every unit with Gulf lubricants and fuels—and extra hours of trouble-free operation."

Another big earth-moving project where Gulf quality lubricants and fuels work as a team to keep the job rolling smoothly.

Gulf lubricants provide better protection for equipment that's pushed to the limit to beat contract schedules — and Gulf fuels insure full power. Result: an extra margin of performance, fewer delays, lower maintenance costs, bigger profits!

Write, wire, or phone your nearest Gulf office today and arrange to use Gulf quality petroleum products on your operation. They are quickly available to you through 1200 warehouses located in thirty states from Maine to New Mexico.

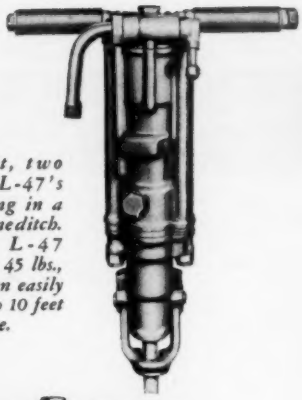
Gulf makes available top quality passenger and truck tires — ask your Gulf representative

Gulf Oil Corporation · Gulf Refining Company

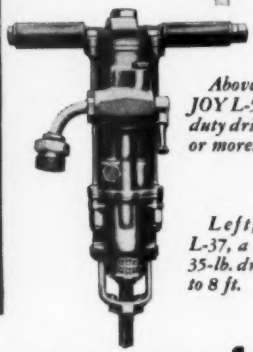
Division Sales Offices:

Boston · New York · Philadelphia · Pittsburgh · Atlanta New Orleans · Houston · Louisville · Toledo

GULF



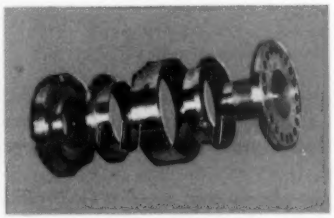
Left, two JOY L-47's working in a pipe-line ditch. The L-47 weighs 45 lbs., and can easily drill to 10 feet or more.



Above, the 55-lb. JOY L-57, for heavy-duty drilling to 15 ft. or more.

Left, the JOY L-37, a hard-hitting 35-lb. drill for depths to 8 ft.

Faster, harder *PUNCH* gives you more footage!



Famous JOY DUAL VALVE makes air do more work

JOY SILVER STREAK CADMIUM-PLATED DRILLS

The *exclusive* features of JOY "Silver Streak" Drills—cadmium plating and the famous "Dual Valve"—mean just this to you: faster drilling and less cost per foot of hole—smoother operation, easier on the drill-runner—longer service life and less maintenance. ● Prove these advantages for yourself—write for bulletins, and let us arrange a demonstration for you *on the job!*

SAVE TIME
with JOY THRO-WAY BITS

WAD C2068

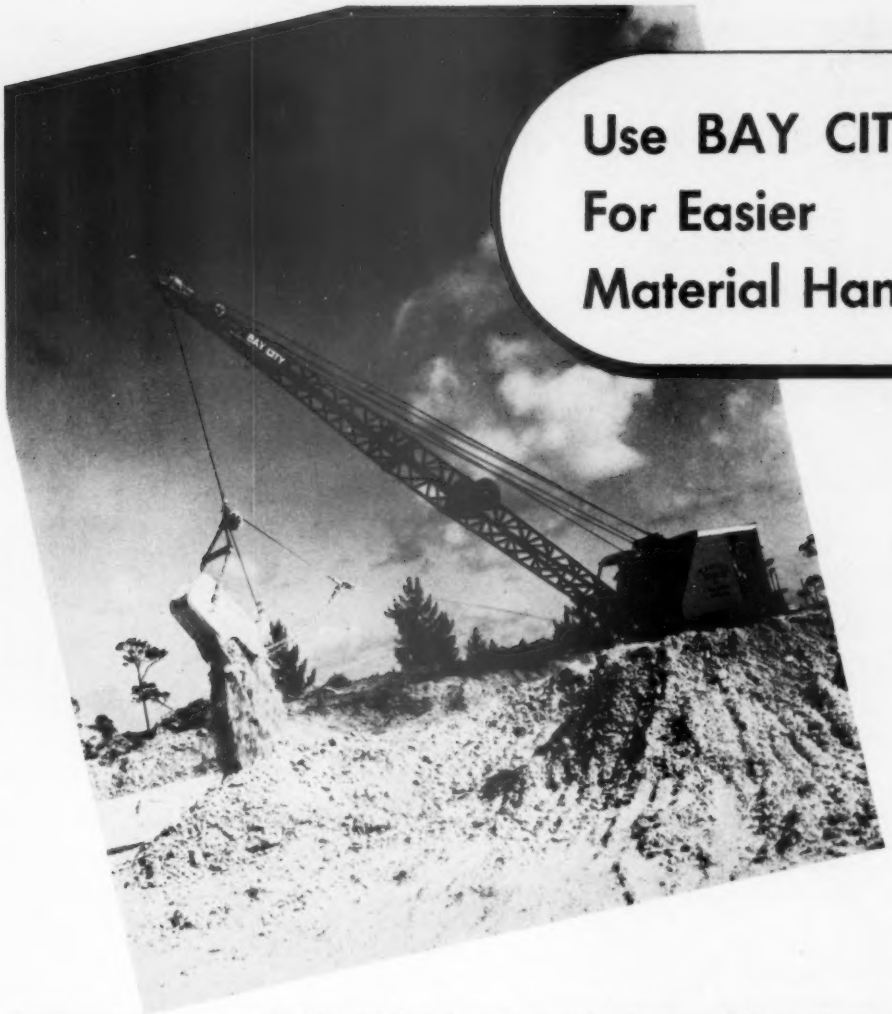
Consult a Joy Engineer

JOY MANUFACTURING COMPANY

GENERAL OFFICES: HENRY W. OLIVER BUILDING · PITTSBURGH 22, PA.

IN CANADA: JOY MANUFACTURING COMPANY (CANADA) LIMITED, GALT, ONTARIO

Use BAY CITY For Easier Material Handling



Working for T. J. James Construction Company of Miami, Florida, this BAY CITY Model 45 dragline keeps sand and gravel moving to a nearby road job without interruption. A Model "45" dragline handles small jobs with ease and tackles the big ones without hesitation . . . helical cut gears for smooth, quiet operation . . . tandem drums for straight, direct cablelead . . . 12½-ton rated capacity. The Model 45 is quickly convertible and whether equipped as shovel, dragline, clamshell, pile-driver, or hoe it is truly "the biggest value in ¾ yard machines". Write, wire, or phone for complete facts on the BAY CITY "45".

BAY CITY

SHOVELS • CRANES • HOES • DRAGLINES • CLAMSHELLS

BAY CITY SHOVELS INC., BAY CITY, MICHIGAN See your nearest Bay City dealer for excavating and material handling equipment in sizes from ⅜ to 1¼ yard with crane rating up to 20 tons. Both crawler and pneumatic tire mountings.

there's a

TON OF DUMPTOR STRENGTH

for every ton of payload

ASK TOO ABOUT KOEHRING HEAVY-DUTY ½, ¾, 1½, 2½-YD. EXCAVATORS

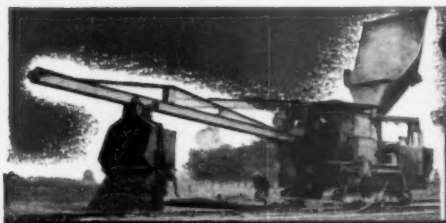
Write for illustrated bulletin on new 2½ yard Koehring 1005 Shovel.

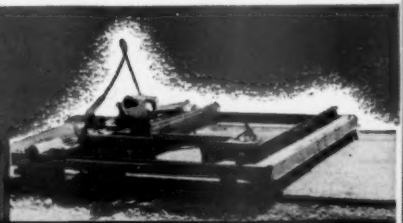
Dumptors* stand up under the severest shocks of shovel-loading 1½ to 2½ yards or rock at a pass because they're built extra tough for rock handling. There's more than a ton of net vehicle weight for every ton of payload.

All-welded body sides, ends and bottoms are heavily reinforced with 4" channel ribs. More than triple strength has been built into the bottom . . . seasoned 1⅜" oak timbers are securely bolted between two layers of 5/16" steel plate. Steel-oak-steel construction cushions shocks of rock loading. Free-swinging, kick-out pan adds another tough 3/16" high-manganese steel plate for extra protection. Dumptor also has: rugged main frame, 8" ship-channels, heavily trussed . . . one-piece steel drive-axle housing and transmission case . . . 4" chrome steel drive axles . . . cast alloy steel "I" beam steering axle. All add extra strength to Dumptor chassis.

Heavy-duty construction like this assures you that Koehring Dumptors will stand up under your toughest assignments . . . that there will be little down time with Dumptors on your job. For complete facts, see your Koehring distributor today.

*Trademark Reg. U. S. Pat. Off.



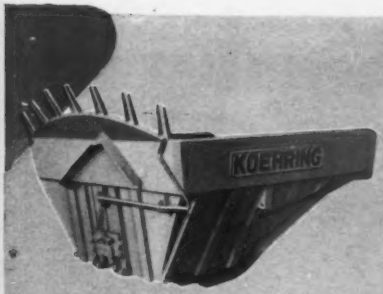


KOEHRING HEAVY DUTY

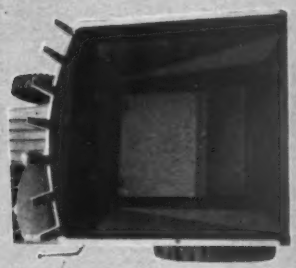
KOEHRING COMPANY

MILWAUKEE 10, WISCONSIN

SUBSIDIARIES: KWIK-MIX • PARSONS • JOHNSON



DUMPTOR BODY HEAVILY REINFORCED All-welded sides, ends and bottom of heavy-duty 6-yard Dumptor body are heavily ribbed with 4" channels. High-carbon steel gives extra strength and protection at stress points...where the abrasive action of rock handling is most severe.



KICK-OUT PAN adds an extra 3/16" high-manganese steel plate on top of sturdy Dumptor bottom . . . breaks suction of sticky materials for fast, clean dump. Big 8' x 8' top gives easy-to-hit target for fast loading over the side or end with less spillage.

1 SECOND GRAVITY DUMP . . . Operator trips body release lever . . . gravity instantly tilts scoop-shaped body. One second later, load is out and Dumptor is off for another load. No slow-moving body hoists . . . no body hoist maintenance.

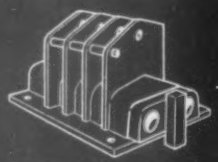
CK910S

Johnson

Faster Operation for EXTRA TONNAGE

Most Sizes Now Available for Quick Delivery from Distributor's Stock

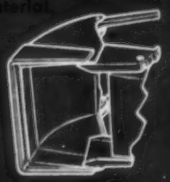
¾ to 3½ yard General Purpose Wide Range Handling Heavy-Duty Digging



FASTER OPERATION, because lower sheaves are angle mounted to maintain natural cable alignment.

FASTER OPERATION, because double hinge construction gets big bites with fast closing for any material.

FASTER OPERATION, because sealed needle bearings on closing sheaves eliminate friction.

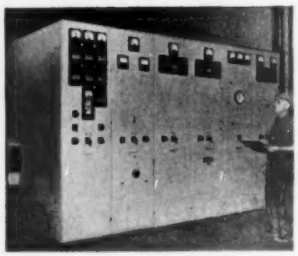


FASTER OPERATION, because all-welded clams, smooth inside and out, dig and dump with less resistance.

THE C. S. JOHNSON COMPANY

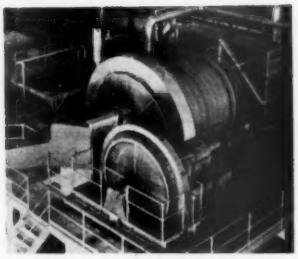
KOEHRING SUBSIDIARY, • CHAMPAIGN, ILLINOIS

1 In the new plant practically all the electric equipment was supplied and co-ordinated by General Electric. Photo shows (inside circle) the G-E outdoor package substation which steps down incoming power from 69,000 to 4160 volts for distribution to five unit substations located at plant load centers. Complete and ready to install, G-E package substations cut installation time and costs, help get production going sooner.



2 The old power system is interconnected with the new purchased power system by means of this 2400-volt, 5000-kva G-E Metal-Clad switchgear. Containing adequate interrupting capacity for short circuit protection, these G-E units are completely metal-enclosed for personnel safety.

3 Here is one of several G-E control stations, at which all related processes of a given department are closely co-ordinated by one operator. Combining indicating instruments and signal lights with pushbutton stations and selector switches, they permit efficient use of manpower.



4 Driving this primary wet ball mill (capacity 235 barrels per hour) is a 500-hp, 4160-volt G-E synchronous motor. Meeting the highest standards of performance, G-E synchronous motors are extensively used for maintaining exact speeds and for improving power factor in many cement plants.

You can put your confidence in—

GENERAL ELECTRIC

658-1

CO-ORDINATED ELECTRICAL SYSTEM PAYS OFF!

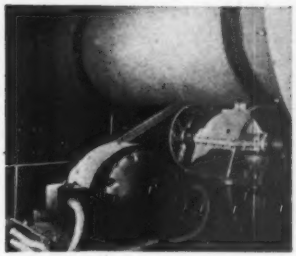
Ideal's new Portland cement plant uses General Electric co-ordinated drives throughout—from primary crushers to packing conveyors—for operating economy.

At the end of their new plant's first year of successful operation, the management of Ideal Cement Company at Portland, Colorado, is well pleased with their General Electric "packaged" electrical system.

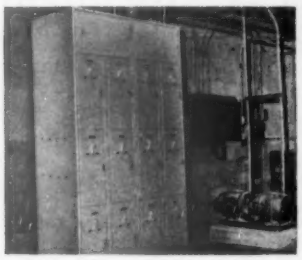
Practically all the components in this system were supplied by General Electric, a company which manufactures *all* the electrical components you require.

G-E application engineers familiar with the problems of the cement industry, and assisted by specialists in particular product lines, carefully selected, co-ordinated, and installed the components as a system—complete and ready to go!

Whether you plan a complete new plant, or the modernization of an existing one, you'll save time and money by consulting your G-E representative first. *Apparatus Dept., General Electric Company, Schenectady 5, N. Y.*



5 This 125-hp, 440-volt G-E motor drives one of the plant's two rotary kilns, each 400 feet long. Built to require minimum maintenance, these motors are not affected by the heat of the kiln. Other G-E induction motors in this plant operate conveyors, pumps, fans and crushers.

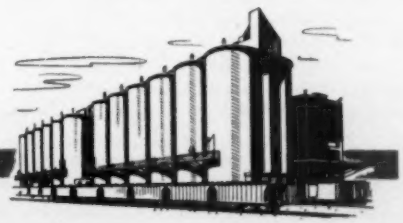


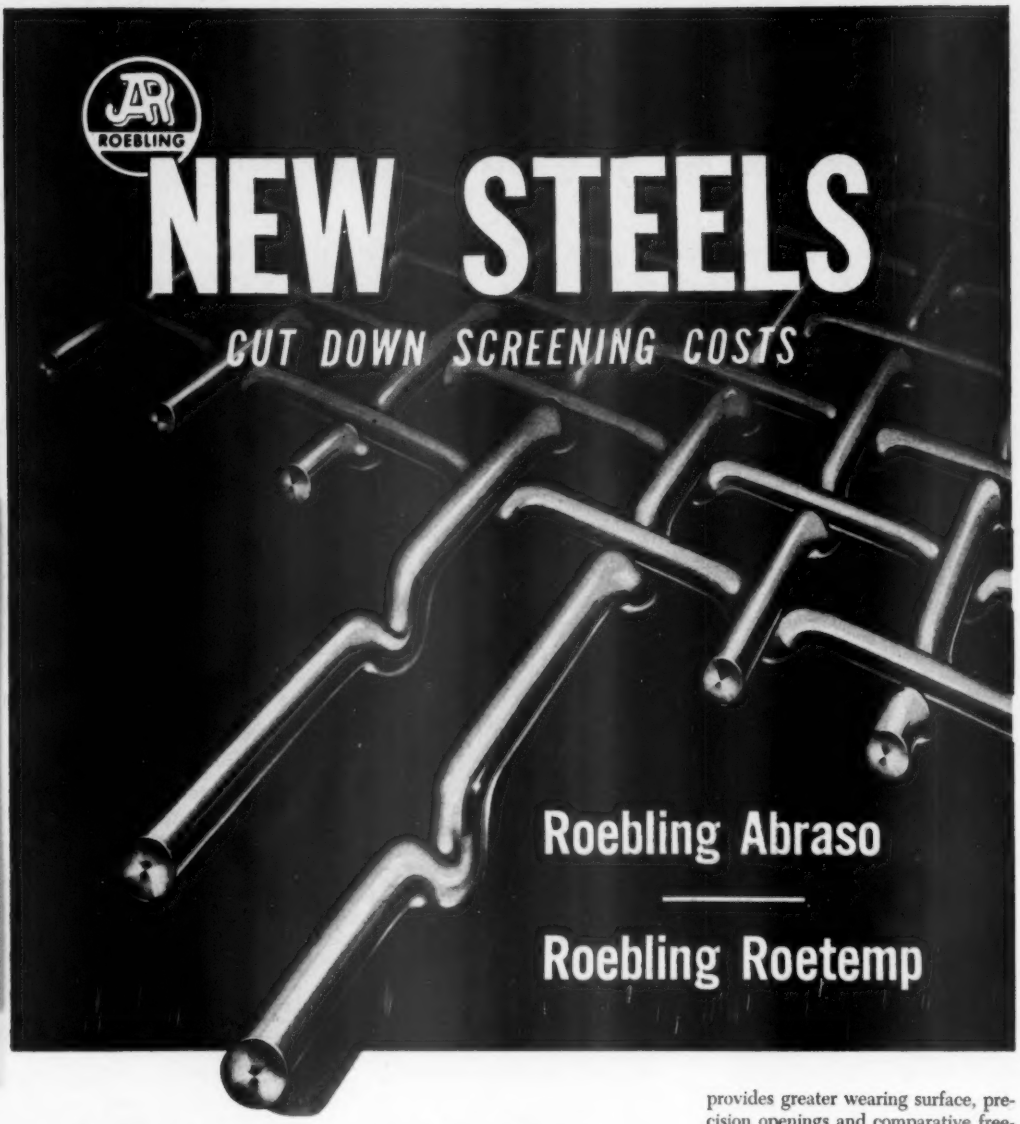
6 Controlling a number of 440-volt G-E motors in the new crushing plant is the G-E Cabinetrol* shown. Compact and factory-assembled, it provides conveniently centralized low-voltage motor controls. Its rigid steel enclosure promotes personnel safety, minimizes disturbances due to dust.

*Reg. U. S. Pat. Off.

7 This G-E Limitamp control lineup contains starters for 4 G-E 4160-volt synchronous motors, two rated at 1000 hp, two at 500 hp. Combining high-voltage motor control with built-in short-circuit protection, these controllers will protect their connected drive up to ¼-million kva fault level.

Everything you need to cut rock product costs . . . electrically!





LONGER LIFE FOR AGGREGATE SCREENS

NOW ROEBLING MAKES two types of steel wire that will save you plenty of screening dollars. They're called "Abraso" and "Roetemp", and they were developed expressly for aggregate screen service. "Abraso" is a special-analysis hard-drawn wire with high resistance to vibration fatigue. "Roetemp" is an oil-tempered wire with top resistance to abrasion. Both wires are exceptionally hard and tough.

Abraso and Roetemp steel wires are woven into Roeton, Roeslot and square mesh screens with ¾ inch space and larger. All these screens are made in Roebling's Roeflat construction which provides greater wearing surface, precision openings and comparative freedom from clogging. In smaller sizes, other constructions can be furnished.

We invite you to try screens woven from Abraso and Roetemp steel wire and to compare them with the screens you are now using. And take the first step towards screening economy *today*—write for Roebling's Aggregate Screens Catalog. John A. Roebling's Sons Company, Trenton 2, New Jersey.

WRITE OR CALL THE ROEBLING FIELD MAN AT YOUR NEAREST ROEBLING OFFICE AND WAREHOUSE

Atlanta, 934 Avon Ave. ★ ***Boston,*** 51 Sleeper St. ★ ***Chicago,*** 5525 W. Roosevelt Rd. ★ ***Cleveland,*** 701 St. Clair Ave., N. E. ★ ***Denver,*** 1635 17th St. ★ ***Houston,*** 6216 Navigation Blvd. ★ ***Los Angeles,*** 216 S. Alameda St. ★ ***New York,*** 19 Rector St. ★ ***Philadelphia,*** 12 S. 12th St. ★ ***Pittsburgh,*** 855 W. North Ave. ★ ***Portland, Ore.,*** 1032 N. W. 14th Ave. ★ ***San Francisco,*** 1740 17th St. ★ ***Seattle,*** 900 First Ave.

ROEBLING

☆ ***A CENTURY OF CONFIDENCE*** ☆

CHUTE COSTS CUT 66%
AT STUART M. PERRY COMPANY
WITH J&L JALLOY HEAT-TREATED STEEL PLATES

J&L STEEL

In Perry's primary crusher J&L heat-treated JALLOY plates lasted ten times longer than mild steel under a daily pounding by 700 to 800 tons of blue limestone.

Shaker tailing chutes receive severe sliding abrasion. ⅜" J&L plates lasted 22 weeks in this application—7 times service life of mild steel.

Lower Maintenance . . . Longer Service Life Result in the exclusive use of J&L JALLOY on all chutes at stone crushing plant.

The Stuart M. Perry Company, quarrymen, of Winchester, Va., has turned to J&L JALLOY heat-treated steel to provide more efficient chute liners. Perry found that JALLOY plates last four to twenty times longer than mild steel.

The result—"JALLOY steel has cut my chute costs by two thirds." That's what Thurman Perry, supervisor of the Stuart M. Perry Company, had to say about the JALLOY steel he ordered from William G. Wetherall, Inc., Baltimore, Md.

But more specifically here's how J&L JALLOY reduced Perry's maintenance costs:

- **Used as a grisley plate in the primary crusher—JALLOY lasted 5 months—10 times longer than mild steel—Saved 44 man hours per JALLOY installation.**
- **As the bottom chute in a 3 ft. Symons Cone Crusher—JALLOY was still in operation after 16½ months—four times the life of mild steel.**
- **As the head chute from the bucket elevator—JALLOY lasted 16 months—20 times the life of mild steel—Saved 80 man hours labor.**
- **As a shaker tailing chute—JALLOY lasted 5 months—7 times longer than mild steel—Saved 72 man hours labor.**

J&L heat-treated JALLOY, a fine grained, manganese-moly steel, has a yield strength of 160,000 lbs. per sq. inch and a Brinell hardness of 341 to 388. It is available in the form of bars and in plates up to 72" wide and 20' long, with thicknesses from 3/16" to 1½".

Although twice the price of mild steel, JALLOY'S long life saves money in applications where impact and abrasion are severe such as: conveyors, crushers, scrapers, bulldozers, power shovel buckets, dump cars, and heavy-duty truck bodies.

Write for the booklet "JALLOY—J&L Alloy Steel." It contains information on properties, heat-treating, and the workability of this *modern* steel. The coupon is for your convenience.

Jones & Laughlin Steel Corporation
465 Jones & Laughlin Building
Pittsburgh 19, Pa.

Please send me your data booklet:
"JALLOY—J&L Alloy Steel."

NAME_____

COMPANY_____

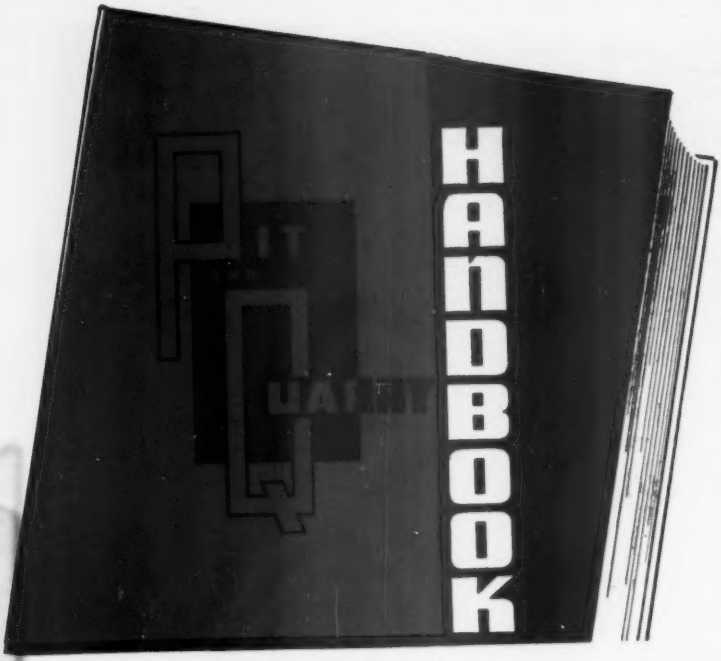
ADDRESS_____

Do you recommend J&L JALLOY Steel for:_____

JONES & LAUGHLIN STEEL CORPORATION

From its own raw materials, J&L manufactures a full line of carbon steel products, as well as certain products in OTISCOLOY *and* JALLOY *(hi-tensile steels).*

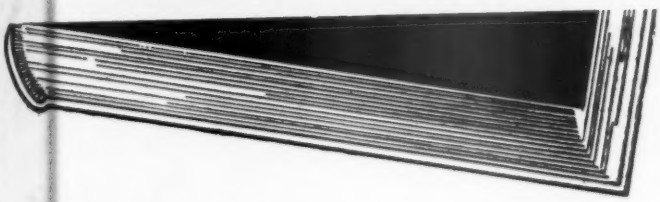
PRINCIPAL PRODUCTS: HOT ROLLED AND COLD FINISHED BARS AND SHAPES • STRUCTURAL SHAPES • HOT AND COLD ROLLED STRIP AND SHEETS • TUBULAR, WIRE AND TIN MILL PRODUCTS • "PRECISIONBILT" WIRE ROPE • COAL CHEMICALS



An Indispensable Tool For Both Operator and Supplier of Equipment

The pit-and-quarry industries, in providing important basic raw materials, bear a large share of the responsibility for the success of America's industrial effort. For the producer the revised Technical Section of the 1949 Handbook provides a ready answer for many of his operating problems. For the concern supplying him with the machinery and equipment necessary to produce his materials, the 1949 Directory Section provides an accurate, up-to-the-minute list of all known producers of nonmetallic minerals and their products. No effort or expense has been spared to make the new Directory an efficient and highly useful source of information about producers. The number of changes made in the 1949 edition runs into the thousands.

1949 Edition— Order Now



Directory Section listings appear two ways — (1) alphabetical by companies, (2) geographical by plants. You get company names, officers, location of plants, their capacity, and the names of the men who do the buying.

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- 27 CHAPTERS
- AUTHORITATIVE
- 15,000-NAME DIRECTORY
- COMPLETELY INDEXED

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Name ..... Title .....

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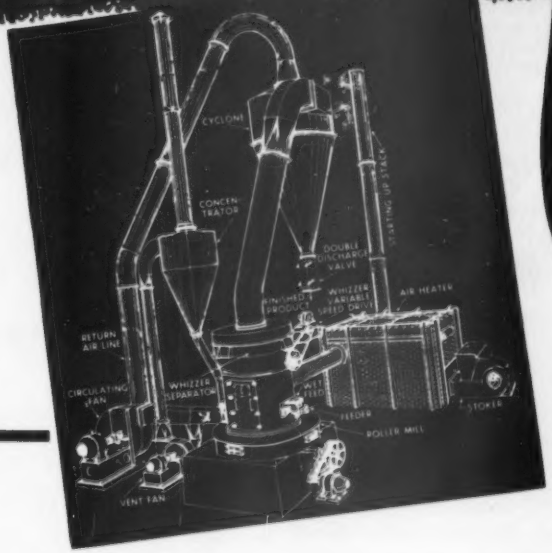
Cutting PRODUCTION *Costs . . .*

with RAYMOND ROLLER MILLS



Typical arrangement of equipment for Raymond Roller Mill with flash drying system.

Combination DRYING and PULVERIZING OPERATIONS:

LIMESTONE . . .

Evaporating surface moisture from limestone screenings or pre-crushed material and pulverizing to finenesses anywhere in range from 20 mesh up to essentially all passing 325 mesh, for use in coal mine dusting, cattle feed mineral additive, asphalt filler and high fineness filler in other products.

GYPSUM . . .

Drying and grinding raw gypsum, or pulverizing calcined product, to customary 85 to 90% passing 100 mesh or finer.

CLAY . . .

Drying and grinding to high percentage passing 100 or 200 mesh, depending on finished product requirements, with removal of moisture during pulverizing process.

BARYTES . . .

Mill equipped with flash drying to remove surface moisture in raw material as mined, and delivering fine, uniformly classified, finished material.

PHOSPHATE ROCK . . .

Ideal equipment for grinding . . . and drying, if necessary . . . phosphate rock to fineness reqired for acidulation or direct application to the soil.

THE multiple savings in process time, operating expense, material handling and maintenance, made possible by the *flash-drying-equipped* Raymond Roller Mills, provide a very definite means of cost reduction in the non-metallics field.

As a result, separate dryers and conveyors are unnecessary . . . less floor space is required . . . the operation is automatic and dustless . . . close product control is assured, and today's strict specifications are easy to meet.

If your problem involves drying or pulverizing, or both combined, you can be sure of maximum economies when you use Raymond equipment. Write for details.

COMBUSTION ENGINEERING - SUPERHEATER, INC.

RAYMOND PULVERIZER DIVISION

1321 North Branch Street, Chicago 22, Illinois

Write for information concerning your grinding problems.

Sales Offices in Principal Cities

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SINCE 1887

. . . TO GIVE YOU THE BEST IN MULTIWALL SERVICE

When you can't estimate your future Multiwall needs right on the button, it's handy to have a supplier near for prompt service.

With the facilities of seven Bemis Multiwall plants available through thirty-six sales offices across the country, you are in a much better position to keep your multiwall supply in line with your needs.

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. . . a straight line

is the economical distance between two points!

The straight-line operation of an Oliver "Cletrac" tractor and Sargent Overhead Shovel will cut your costs . . . *plenty!* Here's why!

This unit crowds *directly* back in digging or loading . . . moves *directly* forward to load out trucks. The shovel arms swing *directly* over the tractor. Contrast this fast action to ordinary loaders where the tractor must crowd into the pile . . . back out . . . turn around and travel to truck or dumping pile. Easy to see why jobs move so much faster . . . why you can really cut costs!

And, the Basic Overhead unit can be quickly and economically converted to a Backhoe, Bulldozer, Pipe Handler, or Log Loader . . . a complete crew at a fraction of the cost of combined individual units.

Your Oliver "Cletrac" Distributor will be glad to give the complete, cost-cutting story.

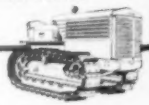
Cletrac

a product of

THE OLIVER CORPORATION

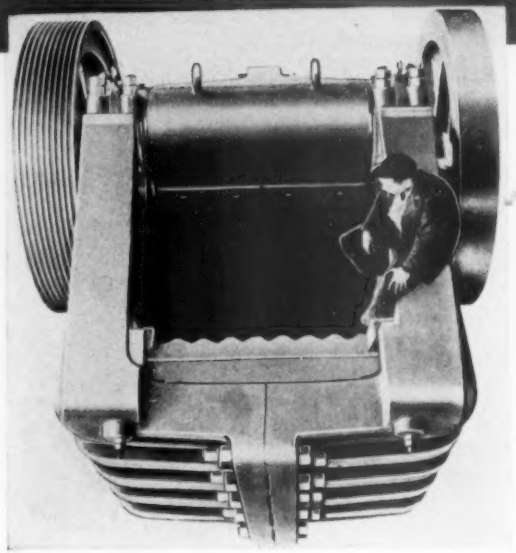
Industrial Division: 19300 Euclid Avenue, Cleveland 17, Ohio

A complete line of crawler and industrial wheel tractors



"THE SIGN OF EXTRA SERVICE"

IT COSTS *LESS* TO OWN THE BEST!



KENNEDY
SWING JAW CRUSHERS

Frames built of HERCULITE steel; tensile strength up to 60,000 pounds per square inch.

Swing jaws, 18" and larger, are reversible; two wears obtained.

Wide faced belt and fly-wheel for non-slip power.

40 DIFFERENT SIZES AVAILABLE FROM 4" X 6" TO 66" X 96"

Powerful crushers, designed to handle heavy loads. A superior reduction unit which produces large rock tonnage, economically and efficiently. When you buy crushing equipment, keep these *exclusive* KVS features in mind.

Both jaws "share the load"; swing jaw and stationary jaw set at the same angle; less power required for swinging and crushing; both jaws interchangeable and reversible end for end; both identical in length.

Here's a properly designed machine that delivers bigger loads at a LOW operating cost. Sturdier construction throughout assures longer life, less time lost through breakdowns. These basic built-in features are pertinent reasons why KVS crushers continue to earn larger profits for their users.

Long life adds many dollars to earning capacity . . . helps every crusher pay its initial cost quickly. Used by leading producers of aggregates from coast-to-coast. Their endorsement proves that "It Costs Less To Own The Best." Specify KVS and enjoy top quality.

Send for Bulletin describing, fully, all types of KVS crushers

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TWO PARK AVENUE, NEW YORK 16, N. Y.

EATON
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AXLES

Last Longer because Moving Parts are Always Thoroughly Lubricated

More Than a Million Eaton 2-Speed Axles in Trucks Today

Eaton's exclusive forced-flow lubrication system starts oil on its way to all moving parts the instant the axle turns over. This protection to gears at low truck speeds, as well as high, reduces friction and wear on moving parts, adds thousands of miles of trouble-free life to Eaton 2-Speed Axles. Your truck dealer will be glad to explain how Eaton Axles contribute to lower operating and upkeep costs by embodying a balanced combination of pulling power and speed on most trucks of the 1½-ton class and larger.

Axle Division
EATON MANUFACTURING COMPANY
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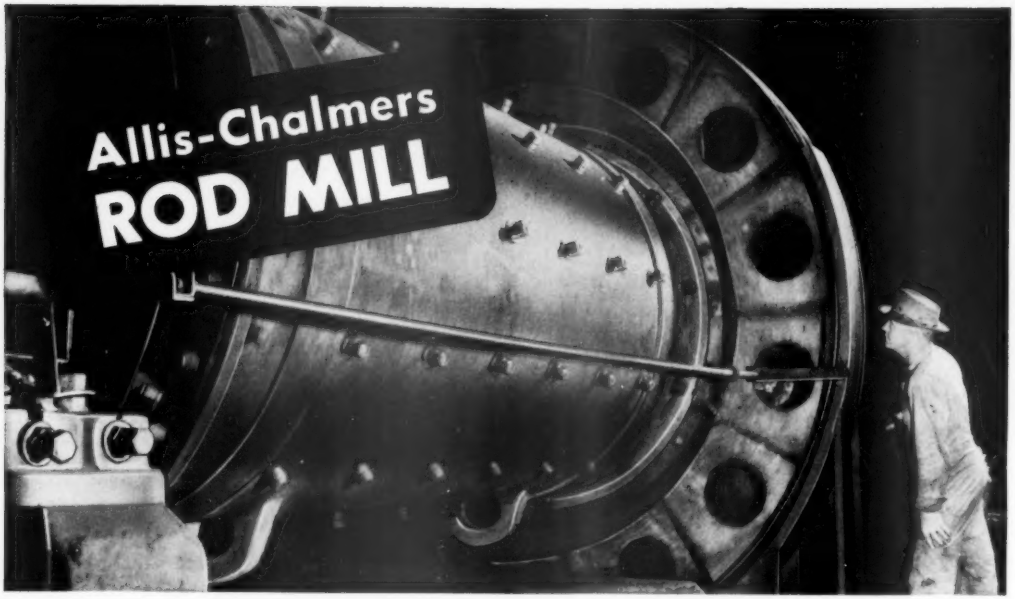


On the Job 24 Hours a Day... After 27 Years!

MILLIONS OF TONS of sulphide ores have gone through this 6 x 12 ft Allis-Chalmers rod mill in 27 years' operation. On the job 24 hours a day, it grinds 87½ tons per hour, reducing ¾ inch crushed ore to 20-mesh ball mill feed. Sturdiness like this can only be the result of sound mill design.

Allis-Chalmers' experience in building over 4,000 grinding mills makes it possible to offer you these modern features:

- Heavy welded plate shells, fully "stress-relieved" before machining.
- Self-aligning trunnion bearings are available with pressure pump for "floating" the mill before starting.
- Accurately machined mill heads and shell flanges provide perfect alignment when bolted together.
- Trunnions cast integral with heads for severe service. Fewer parts.

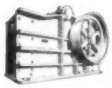
When you choose a grinding mill you'll get top efficiency and economy only if your mill is well-suited to your specific application. Allis-Chalmers builds rod mills, ball mills in both overflow and grate types, pebble mills, and multi-compartment *Ballpeb* and *Compeb* mills in a maximum range of sizes.

Allis-Chalmers mills are available with four types of feeders, three types of drives, a choice of liners and discharge arrangements. This means you'll get the mill that gives you top performance. And Allis-Chalmers furnishes motors, control and V-belt drives—the whole installation from one company.

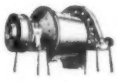
Sound advice on your grinding problems can be obtained from the A-C representative in your area. Allis-Chalmers offices or distributors are in principal cities in the U.S.A. and throughout the world.

A-2831

Kilns, Coolers, Dryers


Jaw Crushers

Hoists


Mills

Gyratory Crushers

Vibrating Screens

AND OTHER EQUIPMENT FOR THE CRUSHING, CEMENT AND MINING INDUSTRIES

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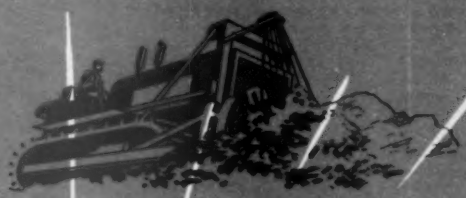
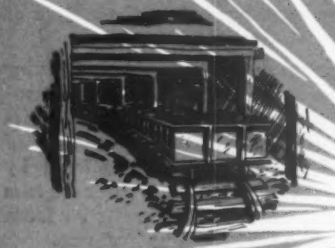


CONSTRUCTION

COAL MINING



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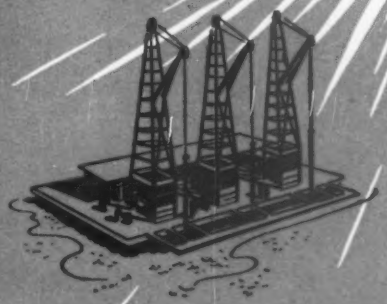

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"No-Vent" Short-Period Delay Electric Blasting Caps: Permit twelve closely-timed delay intervals within a period of approximately 400 milliseconds. They reduce vibration, keep backbreak to a minimum, improve fragmentation.

Write for 32-page book, "Hercules Explosives". HERCULES POWDER COMPANY *960 King St., Wilmington 99, Del.*

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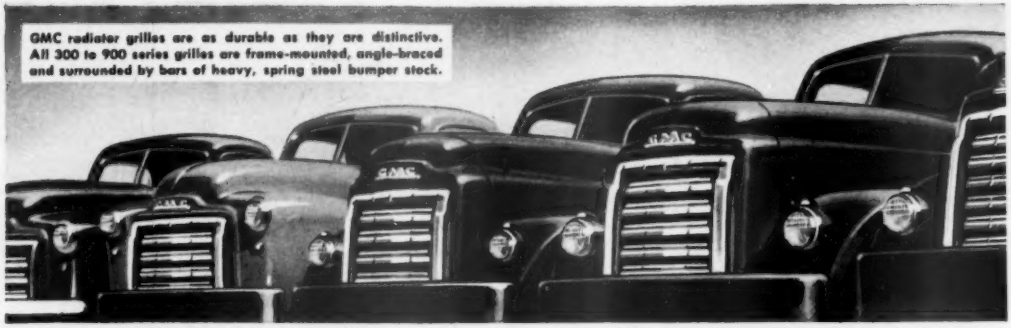
ERD-2



GMC radiator grilles are as durable as they are distinctive. All 300 to 900 series grilles are frame-mounted, angle-braced and surrounded by bars of heavy, spring steel bumper stock.

BACK OF THESE "BUMPER-BAR" GRILLES...

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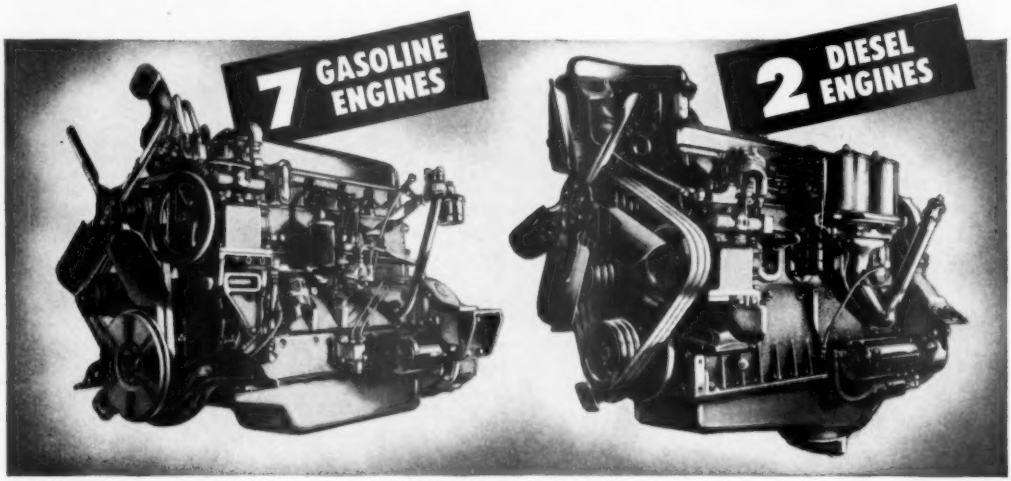
Much of this increase can be attributed to the famous GMC truck-built engine line... because everyone recognizes the engine as the "heart" of any motor truck.

GMC now offers an engine range to fit every vocational requirement. Each engine, gasoline or Diesel, is the most powerful in its class with the most advanced features of design and construction ever offered by GMC. From every angle GMC truck engines are the "best in the business"... from every angle the best for your business.



GMC gasoline engines range from 228 to 503 cu. in. displacement and from 95 to 190 horsepower. From the smallest to the largest, they are all GMC-built... all of war-renowned "Army Workhorse" design.

GMC
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GMC Diesel trucks are powered by famous GM 2-cycle four and six cylinder Diesel engines that are outstanding for light weight and great economy. The four develops 133 horsepower; the six provides 200.

GMC TRUCK & COACH DIVISION • GENERAL MOTORS CORPORATION

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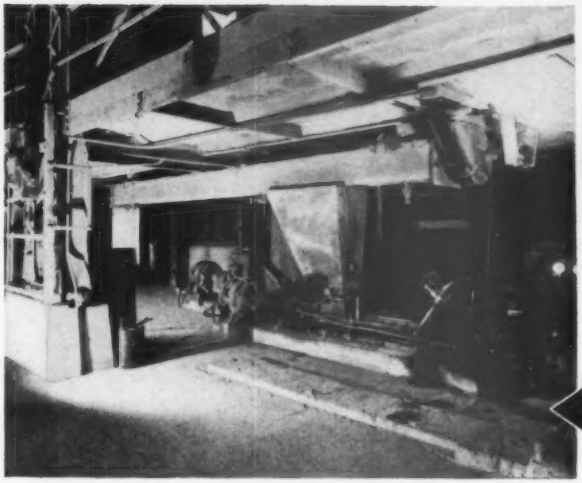
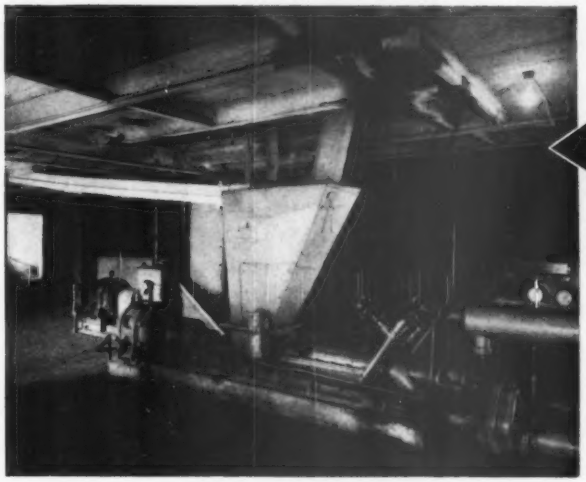


WITH THE

F-H AIRSLIDE

Conveying raw-material fines from air separators to a Fuller-Kinyon Pump.

BEFORE Raw-material fines were conveyed by a 12-inch screw conveyor, driven by a 5-hp. motor, through a speed reducer, sprocket and chain. The installation was dusty, noisy, costly, as to power, lubrication, and wear. Liable to breakdown, resulting in costly labor charges for replacement and repairs, and down-time.



AFTER Material now conveyed by a 10-inch Airslide, eliminating dusty condition, noise, lubrication and wear. Power is reduced to a minimum; one-quarter horsepower. The Airslide is self-cleaning, and safe from mechanical hazards . . . no moving parts.

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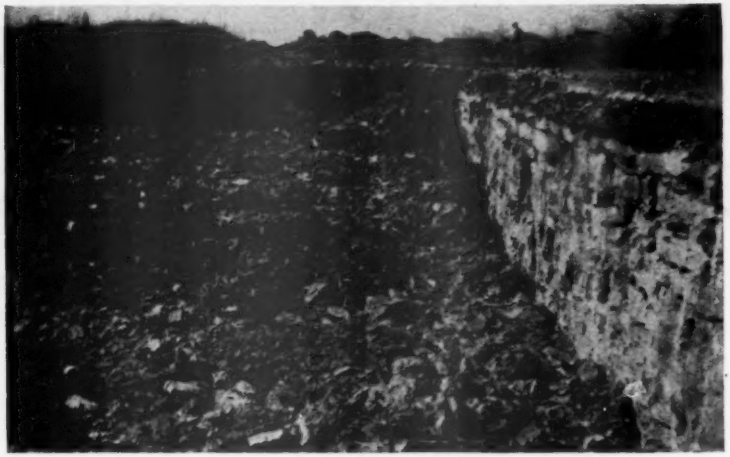

Here Is What Happens When You Use The ROCKMASTER "16" Blasting System!

HERE's the kind of rock-pile blasters dream about! Rock ready for the shovel . . . no boulders too big for the dipper . . . a clean face . . . no toe . . . no backbreak. Blasters get the kind of results they want in quarries, mines, and construction jobs—on the surface and underground —when they use the ROCKMASTER "16" Blasting System to "tailor" the blast to the job. In stripping, they can shoot the burden like this without degrading the coal!

The original Atlas ROCKMASTER development now includes *sixteen* millisecond delay detonators, each timed within thousandths of a second. Your job may call for two, three, even all sixteen. We help you select them to fit the particular job. Drill pattern and explosives are based on what you want to accomplish. This all adds up to greater control over breakage and throw than was ever before possible—plus, in many cases, important savings in drilling and dynamite.

In addition to its many other advantages, ROCKMASTER "16" cuts noise and vibration to a minimum. Bigger shots (generally more economical) can often be made in quarries, strip pits and construction jobs without complaints from neighbors. In underground workings, there is less danger of damaged or loosened roof supports—a real safety consideration.

Write today for booklet on the Atlas ROCKMASTER "16" Blasting System. It includes diagrams for typical loading in quarries, strip pits, mines, and many types of construction.

ROCKMASTER "16" TIMINGS

Rockmaster No.	Avg. Time of Each Delay from Zero (milli-seconds)
0 (zero)	0 (inst.)
1	8
2	25
3	50
4	75
5	100
6	125
7	150
8	175
9	200
10	250
11	300
12	350
13	400
14	450
15	500
16	550

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"Everything for Blasting"

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In every one of these operations, materials are being moved and handled for less—thanks to the continuous, cost-cutting performance of the P&H.

Of the many P&H Added Values, these alone will account for important savings for you. Add all the others and you know why so many operators, mindful of today's changing conditions, are putting P&H Excavators in their pits and yards.

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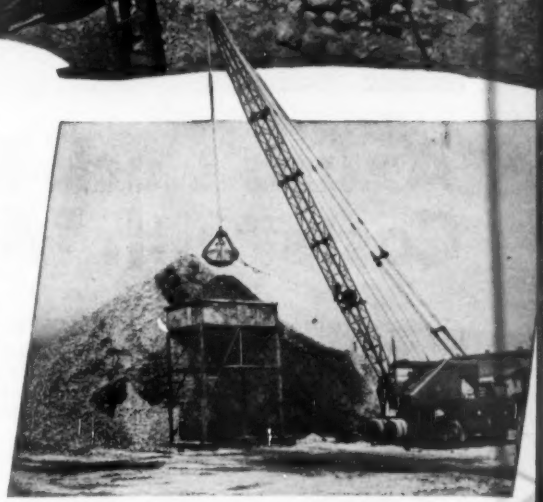
TRUE TRACTOR TYPE CRAWLERS—smoother, more maneuverable and dependable travel; easier steering; ends usual crawler troubles.

WELDED CONSTRUCTION THROUGHOUT—rolled alloy steels make them huskier, shockproof; no needless deadweight.



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Azusa Rock & Sand Co. Cuts Costs with "*A-1*" Jaw Crusher

CALLED ONE OF THE most efficient crushing plants in the country," Azusa Rock & Sand Co. of California installed this 42x32 in. "*A-1*" jaw crusher to break gravel boulders, some as large as 30 inches. Feed runs 100 to 200 TPH; sometimes as high as 250 TPH.

Heavy-going demands like this have been everyday routine, six days a week, for this Allis-Chalmers machine since 1946. Yet, the original main bearings are still going strong. Operation has been practically trouble-free. Only jaw plates and toggle bearings have been replaced.

MANPOWER ECONOMY

Convenient all-electric controls regulate feeder, crusher and belt conveyor to surge pile. All controls are sequence interlocked. Only one operator is needed.

CHECK THESE "A-1" FEATURES

- No choking or packing in the "*A-1*" jaw crusher — crushing is uniformly distributed throughout the entire depth of the crushing chamber.
- Jaw opening nips biggest pieces with minimum slippage.
- Renewable parts protect expensive castings from wear, greatly prolong crusher life.
- Automatic lubrication of main pitman and swing jaw bearings.

Find out more about "*A-1*" *jaw* crushers and other Allis-Chalmers crushers from the A-C representative in your area. Or write for **Bulletin 07B6369A.** Allis-Chalmers offices or distributors are in principal cities in the U.S.A. and throughout the world.

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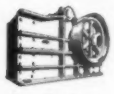
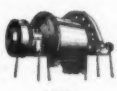
Kilns, Coolers, Dryers



Jaw Crushers

Hoists



Mills

Gyratory Crushers

Vibrating Screens

AND OTHER EQUIPMENT FOR THE CRUSHING, CEMENT AND MINING INDUSTRIES

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. . . FOR A LONGER LIFE

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One of the many tests Quaker Conveyor Belts must go through is shown above. A blowtorch, at high heat, held six inches from the surface of the belt for six minutes. Quaker Belts take it and are ready for more. They're tough, rugged and built for longer wear. They're made for the rock products industry to assure less maintenance . . . to save you loss of labor . . . to help reduce the "break-even point" in your plant operations.

Whatever your need for industrial rubber products there's a Quaker Pre-tested Product to meet it. Power transmission belting for every type of installation . . . rod and sheet packings . . . moulded and braided hose . . . and all kinds of custom-made moulded rubber products. To economize on production costs . . . it pays to Quakerize your plant.

STANDS PRESSURE, RESISTS WEAR

Quaker hose, in moulded and wrapped construction, is ruggedly built of pre-tested materials for trouble-free transmission of air, steam, water, acids, volatiles.

MORE POWER FOR PRODUCTION

In the complete line of Quaker transmission belts and belting pre-testing plays a vital part in providing long service, tight grip, slipless power.

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Vol. 42 OCTOBER 1949 No. 4

PIT AND QUARRY

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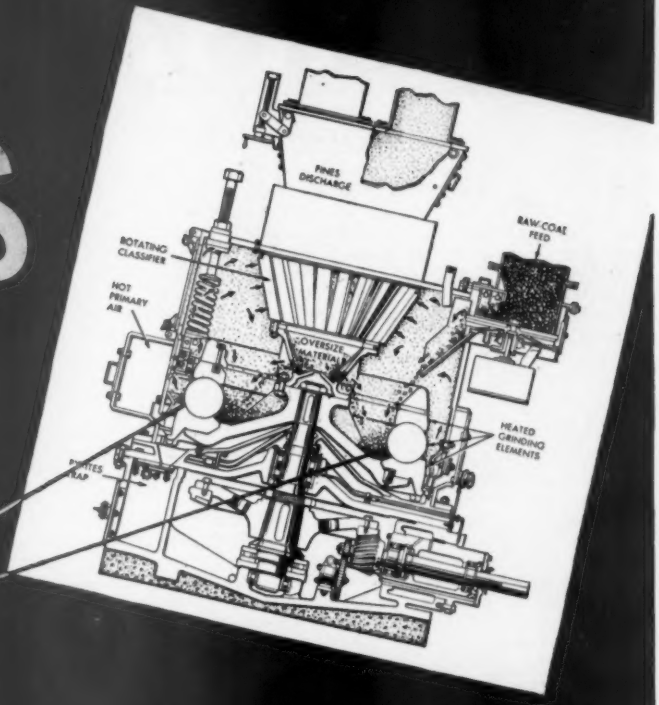

as it

GRINDS

Efficiency of the B&W Type E Pulverizer for direct firing of kilns is unaffected by high-moisture coal. The Type E Mill dries as it grinds, delivering pulverized coal of consistently uniform fineness at a uniform rate, to give maximum kiln production.

BABCOCK & WILCOX

editorial

Bureau of Mines Reorganization

NOTICE of a sweeping reorganization of the U. S. Bureau of Mines, a government department of great importance to the nonmetallic minerals industries, reached the public through an article by James Boyd, director of the Bureau, published in the September, 1949, issue of *Mining Engineering*, monthly publication of the Mining Branch of the American Institute of Mining and Metallurgical Engineers. The Bureau has for many years done excellent work in locating and evaluating mineral deposits, developing more efficient and economical methods of mining and processing, promoting safety, and in many other ways performing invaluable services for these industries and the country. Changing conditions over a period of years apparently have made this reorganization advisable and should enable the Bureau to continue its work even more efficiently than in the past. Mr. Boyd's announcement follows:

"The Bureau of Mines for a number of years has been seeking additional ways and means of improving the efficiency of its operations and increasing its service to the public. It has become obvious that changes in the organization of the Bureau are essential to a more effective accomplishment of its functions and objectives. The old organization was defective in meeting current needs in that the Bureau's field activities were neither sufficiently coordinated with the national program nor were they particularly responsive to local needs of the mineral industries. Further, the traditional organization hampered the efforts of the Bureau to obtain, analyze and provide to the policy-making agencies of the government essential information and advice in such a form that the requirements of domestic industry could be fully taken into consideration in the development of domestic and foreign policies. Consequently, the Bureau has now modified its organizational structure.

"The new organization, which is designed to improve all these phases of the Bureau's work, attempts to delegate maximum responsibility for operations to experiment stations and offices in the field and to leave to the headquarters staff greater opportunities for planning and direction of the Bureau's program and their integration with the minerals activities of other agencies. The basic plan establishes eight semi-autonomous regions, one for Alaska and seven in the continental United States, each region to be headed by a regional director. These regional directors, representing the director of the Bureau in their respective areas, will report to the director in Washington and will be responsible for all Bureau activities in their respective jurisdictions. They will be in contact with the state officials in their regions, and will attempt to handle all problems of a local nature.

"One of the most beneficial results to be expected from the reorganization of the Bureau's activities on a regional basis will stem from simplification of administrative procedure. Previously, even some of the most trivial administrative decisions had to be referred to Washington for action. In the past, each of the Bureau's five divisions maintained separate field offices reporting to the Division Chief in Washington with allotments of funds to each. This resulted in duplicate sets of books, often far out of time phase. Bureau staffs working in the same field offices received orders from separate individuals in far-away Washington. Now the regional directors will have full authority to act. They will be provided with administrative assistants and will control the signing of contracts, the disbursement of funds, the accounting procedures, and personnel management, with only staff direction from the Washington office. It is felt that when the new system is fully established the technical employees will be relieved of administrative tasks and the administrative costs will be substantially reduced.

"In Washington, the new organization will be staff only. The top technical experts will be relieved of the past burden of administrative tasks. They will be able to give full time to the consideration of responsibilities of the Bureau in such a way as to plan the research program in the direction of the greatest need. They will be better able to take part in interdepartmental discussions on policy matters, and to think through carefully the impact of legislation and policy discussions on mineral raw material availabilities and their effect on the domestic mineral industries and the mineral economy of the country as a whole.

"The Washington headquarters has now been organized along line and staff functions. The fundamental operations are organized on a commodity basis, being entrusted to three main operations divisions: Fuels and Explosives; . . . the Health and Safety (considered a commodity for organizational purposes), which remains unchanged from the old organization except for the addition of the Accident Analysis Branch; and Minerals, which includes the former Mining, Metallurgical, and Economics and Statistics Divisions, and will itself be subdivided in branches to handle ferrous metals, nonferrous metals, light metals and other commodity groupings.

"With the Accident Analysis Branch now as an integral and functioning part of the Health and Safety Division, accident statistics will become so integrated with the work that we can measure more accurately the effects and progress of our activities in this field. The industry will be better able to find the weak spots in their own safety programs to the end that accidents can be further minimized in the mines. . .

"The Minerals Division is intended to produce for the mineral industries other than fuels the facts, statistics, and research results more in line with their needs than the relatively uncoordinated results achieved when there were three divisions working separately in that field. We have come to find that the development of these programs is inseparable. Some of this type of direction has long been practiced in the fuels field, with the result that we are better informed and the Bureau's work has been better performed there than in the metals and nonmetallics field.

"The initial stage of reorganization went into effect on September the first, but it will be several months before the final reorganization will be in full operation."

Walter E. Trauffer

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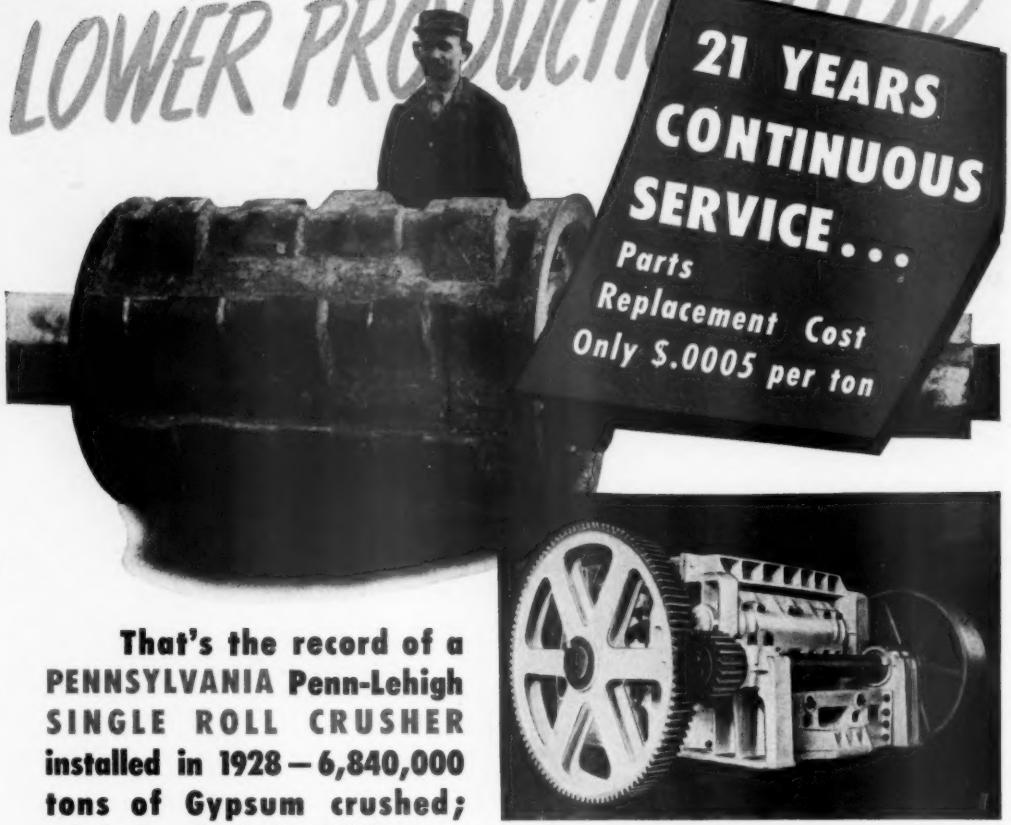
LOWER PRODUCTION COSTS



That's the record of a PENNSYLVANIA Penn-Lehigh SINGLE ROLL CRUSHER installed in 1928—6,840,000 tons of Gypsum crushed; original roll shell still in use.

This record is not unusual and it illustrates pretty well what you can expect from Pennsylvania equipment. It also shows how you can get your production costs down, something that's important to know during this era of high costs.

Pennsylvania's *one-piece*, alloy steel roll shells are the heart of this economy story. No cumbersome, bolted segments with their frozen bolts and high discard losses through scrapping of partly-worn castings. No renewable teeth to work loose as worn tooth-wedges back out under heavy service. Pennsylvania roll shells stay *in* the Crusher where worn teeth are built up by welding—a quick, simple, *single* operation that slashes labor and parts costs; also, out-of-service time.

With power demands as low as ⅓ HP per ton, wherever they are in use "Steelbuilt" Pennsylvania Single Rolls have made a name for themselves for economical reductions of Cement Rock, Limestone, Gypsum, Barytes, and friable Ores.

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Reopen Permanente Plant In Seattle to Serve as Distribution Center

Permanente Cement Company reopened its Duwamish plant, at 5975 East Marginal Way, Seattle, to full operation on September 1. During the last 18 months, the $750,000 installation has been used only on a standby basis for cement storage. Pacific Northwest headquarters of Permanente will also be shifted to the Duwamish location at that time, according to E. H. Kendall, district sales manager.

The Duwamish plant was built in 1946 to serve as distribution center for the Company's Northwest trading area. It consists of a modern packhouse, with a capacity of 40,320 sacks per day; 80,000-barrel-capacity bulk storage silos; spur track facilities; and a car port for servicing truck shipments.

In addition, a fully equipped dolphin pier serves the company's sea-going bulk cement carriers. These ships are equipped with the latest pneumatic cargo-handling machinery, which blows the cement from the holds to the silos ashore in a few hours.

Mr. Kendall states that distribution facilities at Duwamish will be substantially improved to meet the growing cement requirements of the area, which in the last two years has shown a greater increase in the use of cement than any other section of the nation.

N.C.S.A. and A.L.I. to Meet In Chicago Jan. 30-Feb. 1

The announcement of the 33rd annual convention of the National Crushed Stone Association and the 5th annual convention of the Agricultural Limestone Institute, to be held in combination with the Manufacturers Division Exposition, stresses that all producers, whether members or not, will be cordially welcome.

Dates for the N.C.S.A. convention are January 30 and 31 and February 1; A.L.I sessions will be held on February 1, 2, and 3, 1950. All sessions, as well as the exposition, will be held at the Stevens Hotel in Chicago. The first day's program (January 30) will be a joint affair, with a discussion of operating problems in the morning and inspection of the manufacturers' exhibits in the afternoon. The exposition will be held on January 30 and 31 and February 1.

Coming Events

October 10-14, 1949—San Francisco. First National West Coast meeting, American Society for Testing Materials, Fairmount Hotel.

October 19-21, 1949—White Sulphur Springs, W. Va. Fall meeting, National Industrial Sand Association, The Greenbrier.

October 20-22, 1949 — Toledo. Fall operating meeting, National Lime Association, Hotel Commodore Perry.

October 24-28, 1949 — Chicago. 37th National Safety Congress and Exposition, Stevens, Congress, Morrison, Sherman, Palmer House hotels.

November 28- December 3, 1949 —New York. 22nd Exposition, Chemical Industries, Grand Central Palace.

November 29-30, 1949 — Cincinnati. Annual meeting, National Slag Association, Netherlands Plaza Hotel.

January 18, 19, 1950—Washington. Fifth annual convention, National Agricultural Limestone Association, Inc., Hotel Statler.

January 23-27, 1950 — Chicago. 34th annual convention and exhibit, National Sand and Gravel Association, Stevens Hotel.

January 23-27, 1950 — Chicago. 20th annual convention and exhibit, National Ready Mixed Concrete Association, Stevens Hotel.

January 30, February 1, 1950—Chicago. 33rd annual convention, National Crushed Stone Association and Manufacturers Division Exposition, Stevens Hotel.

February 1-3, 1950—Chicago. 5th annual convention, Agricultural Limestone Institute, Stevens Hotel.

February 6-9, 1950—Chicago. 30th annual meeting, National Concrete Masonry Association, Hotel Sherman.

Ideal's Devil's Slide Plant Closed as Supply Reaches 400,000-Barrel Mark

Closure of the Ideal Cement Company's $7,500,000 plant at Devil's Slide, Utah, has been confirmed by Cris Dobbins, executive vice-president of the company. Mr. Dobbins explained that the plant was shut down because "supply far exceeds demand". He added that operations had been curtailed at Ideal's plants in Montana, Colorado, Nebraska, Oklahoma, Arkansas, Texas and Alabama.

A backlog of 400,000 barrels of cement and clinker was reported at Devil's Slide a few weeks ago.

Duration of the shutdown at the Devil's Slide mills, he stated, will depend mainly upon possible large-scale construction in the inter-mountain West. We intend to reopen as soon as possible," Mr. Dobbins said.

According to Harry B. Roberts, sales manager for Ideal in the Salt Lake City district, sales and packing plant operations will continue as usual.

Massachusetts Proposes $75,000,000 Toll Highway

Governor Paul A. Dever has named his appointees to the Massachusetts Turnpike Commission, and they have been confirmed by the State Executive Council.

The commission was created by the 1949 Massachusetts legislature with a $150,000 appropriation to determine the need and feasibility of a toll highway from the Connecticut line near Union, Conn., diagonally across Massachusetts to the New Hampshire line near Salem, N.H.

Estimated to cost some $75,000,000, the proposed 95-mile toll highway would close the missing link in an interstate expressway system from Maine to Indiana. It would connect with toll highways in Maine and New Hampshire.

Named to the Massachusetts commission by Governor Dever were: John R. Kewer of Boston, former chairman of the Boston Metropolitan Transit Authority; Irving E. Rogers of Andover; Henri Goguen of Leominster; and Homer W. Bourgeois of Lowell.

Five state representatives and two state senators remained to be named to the commission.

W. E. Farrell, Founder of Easton Car & Construction And Industry Leader, Dies

William Elliston Farrell, founder and chairman of the Easton Car & Construction Company of Easton, Pa., died at St. Luke's Hospital in Bethlehem, Pa., on August 22 at the age of 79. Mr. Farrell was an early pioneer in the field of industrial mechanized handling, and an international authority on the design and standardization of mine and industrial transportation equipment.

Born in Nashville, Tenn., on February 7, 1870, he attended public schools there and the Webb Brothers School at Culleoka, Tenn. At seventeen he enrolled at Vanderbilt University, taking his postgraduate degree of Mining Engineer in 1891. After a tour of Europe with his professor of metallurgy and a term of teaching chemistry at Vanderbilt, Mr. Farrell went to his first job in heavy industrial manufacturing. He started as a blast furnace chemist for the North Branch Steel Company of Danville, Pa.

All of his business and manufacturing experience was to be centered in the state of Pennsylvania. After four years with North Branch he joined the Philadelphia Roll & Machine Company and was appointed general manager of that firm in 1898. In 1900 he went to the Birdsboro Foundry & Machine Company at Birdsboro, Pa., as general manager. Five years later he joined the Treadwell Engineering Company at Lebanon, serving as general manager and vice-president. He assisted in planning the new Treadwell plant at Easton, and went there as general manager and vice-president. Easton became the home of his industrial activities thereafter.

Mr. Farrell started in business for himself in 1912, opening an office as a manufacturer's representative in Easton. A year later he purchased the manufacturing business of Ernst Weiner & Company, and in 1914 incorporated this business as the Easton Car & Construction Company. He served as president until 1946, when he became its chairman.

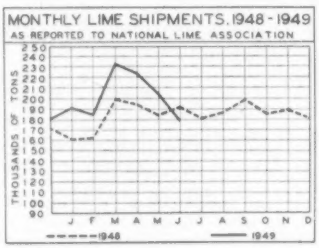
In 1920 Mr. Farrell engaged in a study of quarry haulage problems, an interest in which he remained active throughout his life. Many outstanding contributions toward the development of improved transportation methods in mines and quarries are attributed to his work in this field. Of major importance was his patented development of the revolutionary doorless two-way dumping pan (Phoenix Car) which is now used in many parts of the world. Later he pioneered the use of trucks and trailers in open pit quarries, again featuring the pan body.

Mr. Farrell's research in mine and quarry transportation was followed through the United States and Europe. As a leader in this field, he helped to establish the Manufacturers Division of the National Crushed Stone Association and served as chairman of the group. Tall, keen, and personable, with a lively sense of humor, he was a popular speaker both in this country and before the Institute of Quarrying in England.

Mr. Farrell's career was distinguished by his intensive engineering research. During recent years, he published several articles concerning the history and development of power shovels, stone crushers, and industrial railroad equipment. He was one of the first industrialists to use moving picture films to aid in the study of engineering problems.

W. E. Farrell

Mr. Farrell is suvived by his widow, the former Emily Cottrell of Danville, Pa.; one daughter, Mrs. Norman Stagg, of Ithaca, N. Y.; two sons, Cottrell of Easton, Pa., and Elliston of Long Beach, Calif. He leaves seven grandchildren. Surviving also are two sisters and two brothers.



According to data collected by the National Lime Association, 50 companies in June, 1949 shipped 179,314 tons of lime (106,212 quicklime; 73,102 hydrate). Reporting companies represent 58.9 percent of the association members' total capacity of record. Based on Pit and Quarry's estimate for the remainder of the industry, the total shipments for the month by all plants were approximately 335,000 tons. Shipments by uses and grades for June, 1949, were:

	Quicklime (tons)	Hydrate (tons)
Agricultural	1,026	10,548
Building	14,266	37,411
Chemical	90,920	25,143
Total	106,212	73,102

67-Mile Western Extension Of Pennsylvania Turnpike To Cost $75,000,000 Plus

A bond issue of $75,000,000 to $78,000,000 will be required to finance construction of the 67-mile western extension of the famed Pennsylvania Turnpike, according to an announcement made by Thomas J. Evans, chairman of the Pennsylvania Turnpike Commission.

Mr. Evans revealed that arrangements for the financing were nearing completion, plans being developed by Drexel & Company, B. J. Van Ingen & Company, Blyth & Company and the First Boston Corporation, all investment bankers.

The Pennsylvania Turnpike's original 160-mile section from Irwin, Westmoreland County, to Middlesex, Cumberland County, was completed in 1940 at a cost of $70,000,000 and since has attracted widespread interest as a possible model for toll superhighways in other parts of the nation. The 100-mile eastern extension of the Pennsylvania Turnpike from Middelsex to King of Prussia, near Philadelphia, is under contract.

Hope was expressed by the commission that the 67-mile western extension from Irwin to the Ohio state line would be started in October. The plan under which the present turnpike and eastern and western extensions were combined in 1948 into one system for financing purposes was developed by the same group of investment bankers. They also supervised the initial phase of the program—marketing of the $134,000,000 in bonds to refund the original turnpike bonds and provide $75,000,000 for construction of the 100-mile Philadelphia extension.

Just prior to announcement of plans for financing the westsern extension of the toll superhighway, the managers of the group of investment bankers issued a summary of various reports reflecting the status of Pennsylvania Turnpike Commission activities as of July 31, 1949.

The J. E. Greiner Co., consulting engineers, submitted a progress report on the Philadelphia extension revealing that approximatly 71 percent of the major construction contracts had been awarded up to July 31. Total cost was $41,351,160, or $185,977 in excess of the original estimates.

Ownership of Crystal Lake Trucking and Excavating Co.

In the article, *Completely Portable*, which appeared in the September issue of PIT AND QUARRY, Bill Pfeiffer was listed as plant owner. The Crystal Lake Trucking and Excavating Co. is jointly owned by John Pfeiffer Sr. and his sons, William and John Jr.

Officials of the Standard Lime and Stone Company of Baltimore, Md., have announced that the firm will discontinue the manufacture of mineral wool, which was formerly made at the Wabash, Ind., and Millville, W. Va. plants.

Important Message to Producers Of Nonmetallic Minerals

A development of great interest and importance to all producers of nonmetallic minerals is now transpiring in Washington. On Friday, September 16, the Senate adopted an amendment to H.R. 5268 proposed by Senator Kem of Missouri, providing percentage depletion for sand, gravel, stone, granite, calcium and magnesium carbonates, marble, borax mines and deposits, and all other nonmetallic clays and minerals. Cosponsors of the Kem amendment were Senators Connally of Texas, Hoey of North Carolina, McKellar of Tennessee, Chapman of Kentucky, Martin of Pennsylvania, and Knowland of California. If the Kem amendment becomes law, members of these industries will be entitled to percentage depletion of 15 percent of the gross annual income from their properties for mining operations.

Since the Senate made a number of changes in H.R. 5268, the bill now goes to conference with representatives of the House. The Senate conferees have already been appointed: Senators George of Georgia, Connally of Texas, Byrd of Virginia, Johnson of Colorado, Lucas of Illinois, Taft of Ohio, Millikin of Colorado, Butler of Nebraska, and Williams of Delaware. The House reconvened on September 21 and its conferees will be appointed thereafter. Their names will be made public.

There is no certainty that the House conferees will be sympathetic to all of the amendments to H.R. 5268 adopted by the Senate, including the Kem amendment. Those in touch with this situation also believe that the Treasury Department, while it may not have an especially strong objection to extensions of the principle of percentage depletion, may nevertheless object to other changes made by the Senate. There is also said to be a possibility that the President may veto the bill and that there may not be a sufficient majority in Congress to override a veto.

The information available at this writing makes it clear that getting the approval of Congress is only the first step toward getting percentage depletion for the nonmetallic minerals industries. But this first hurdle must be surmounted, and members of these industries can help to accomplish this. Several of the leading trade associations in this field are urging member companies located in states which have Senators among the Senate conferees to communicate with them promptly by telephone, telegram or letter, requesting their support in conference of the Kem amendment insofar as it applies to the products of their industries. They should be addressed c/o Senate Office Building, Washington 25, D. C.

We further suggest that all nonmetallic minerals producers who want the benefits of percentage depletion not only take such action but also similarly contact the House conferees as soon as their names are made public. It it also believed by some of those close to the situation that it might be helpful for individual companies to make their views and interests known to their senators and representatives whether or not they are conferees. Producers are urged to help remedy existing inequities by getting the benefits of percentage depletion extended to all the nonmetallic minerals instead of the few now enjoying them. Act promptly.—The Editor.

Buffalo Slag Company, Inc. Building $500,000 Plant

The Buffalo Slag Company Inc., is erecting a new $500,000 slag-processing plant on Bethlehem Steel property in Lackawanna, N. Y. To be completed in April, it will give the company the most modern slag processing plant in this part of the country.

Equipped to crush and screen blast furnace slag, the plant will have a screening capacity of 500 t. p. h. It will be operated in addition to the Buffalo Slag Company's Lackawanna plant.

The company has just put into operation a big 4-cu. yd. diesel-electric steam shovel in the slag pits, to load the material into trucks for transportation to crushing plants.

The big shovel will speed up loading operations enormously. It is a diesel-electric P & H model, made by the Harnischfeger Corporation of Milwaukee, Wis. It can fill a big dump truck in a few scoops.

Buffalo Slag gets more than 500,000 tons of slag a year from the Lackawanna plant of Bethlehem Steel—all of the slag available for commercial purposes. It also takes the slag from the Republic Steel, Hanna Furnace, Wickwire Spencer Steel, and Tonawanda Iron plants. Altogether it secures about 1,500,000 tons a year from the Buffalo area steel companies.

3 British Lime Specialists To Attend N.L.A. Meeting

Members of the National Lime Association attending the annual Operating Meeting at the Commodore Perry Hotel, Toledo, O., October 20-22, 1949 will have the pleasure of meeting three important British lime men who are on a visit to this country. They are Dr. N. V. S. Knibbs, a leading authority on lime, and two well-known producers.

All three will address the meeting. They are expected to provide much interesting information on the lime industry in Great Britain and Europe.

Cement Expert from India Gives Paper at U. N. Session

K. Rajagopalaswamy

A recent visitor in Los Angeles was Kurma Rajagopalaswamy, a geologist representing the Associated Cement Companies of India, who is making a national survey of the American cement industry.

On August 16 Mr. Rajagopalaswamy presented a paper on India's limestone deposits and resources at Lake Success before the United States Scientific Conference on the conservation and utilization of resources which he attended as a delegate. His address, entitled *Economics of Organization of Mineral Developments*, was the first comprehensive paper presented before a world assembly on India's limestone, clay, sand, iron and coal resources, with special stress on the economic relationship between these and the cement industry.

Many honors have been won by Mr. Rajagopalaswamy in his field, including his appointment as executive head in charge of the geological and mining department of the Associated Cement Companies, Ltd., in Bombay in 1945. He prospected for cement raw materials in all the provinces of the Indian Dominion, in many states, in Pakistan, and in Ceylon. He has had 14 years of practical experience in the conservation and utilization of raw materials used in cement manufacture — limestone, clay, bauxite, laterite, iron ore, gypsum, coal, etc.

International Talc Replacing Burned Mill with New Plant

The International Talc Company, Gouverneur, N. Y. has made plans to construct a 200-ton mill at Hailesboro, N. Y. at a cost of approximately $1,000,000, company officials disclosed.

The new structure will replace the mill which was destroyed by fire near Hailesboro on May 23, 1948, and will be built on a site nearly adjacent to the present No. 6 mill.

The work of surveying the site has been started and plans are being revised to suit the location. The new mill will enable the company to meet the demand which it is now unable to supply. Capacity at No. 6 mill is 180 tons daily. With the new addition, production will be stepped up to nearly 400 tons daily.

Representatives of the Mine Mill and Smelter Workers signed an agreement with the Mississippi Lime Company for a new two-year contract, with a wage reopener in June, 1950. Terms of the contract granted improved vacation pay and a wage increase of 7½ cents per hour.

Double Feature Held 600 Ft. Below to Honor Alpha Safety Record

In a combined presentation ceremony held 600 feet underground, the Sentinels of Safety Trophy and the Joseph A. Holmes Safety Awards were presented to Alpha Portland Cement Company's Ironton, O., mine on July 29, 1949.

This double honor was accorded the Ironton mine by the United States Bureau of Mines in recognition of its outstanding safety record, which won the 1948 National Safety Competition in the nonmetallic mining group and the Holmes award for operating an underground limestone mine without a lost-time accident from April 19, 1944, to March 1, 1949, with an average of 70 employees working 562,630½ man-hours in a 100 percent mechanized mine.

Mine employees, management and guests, totaling about 100, enjoyed the two-hour program and the luncheon which was served later.

The Ironton mine is a charter member of the National Safety Competition, having been enrolled in each of the 24 annual contests. During this period it has had 15 injury-free years and has won the Sentinels of Safety Trophy two other years—1928 and 1942. The top honor for 1948 was awarded to the Ironton mine for working 135,919 man-hours without a disabling injury.

E. L. Grant, art editor of the magazine *Explosive Engineer*, led off the ceremonies by a talk on the significance of the Sentinels of Safety Trophy at the conclusion of which he presented to John J. Davis, superintendent, the coveted bronze trophy.

Monroe J. Mechling, chief, Health and Safety Division, United States Bureau of Mines, St. Clairsville, O., conveyed to the group the congratulations and best wishes of Dr. James Boyd, director of U. S. Bureau of Mines and Forrest T. Moyer, chief of the Accident Analysis Bureau of United States Bureau of Mines, who were unable to be present. Mr. Mechling made the presentation of the Joseph A. Holmes Mine Safety award to Dan Handley, mine foreman; the "Certificates of Achievement in Safety" to Clifford Butler, assistant mine supervisor, who accepted the individual certificates on behalf of the employees; and the Joseph A. Holmes supervisory award to Dan Handley.

E. F. Brownstead, general superintendent of the Alpha Portland Cement Company, presented an "Old Timer" mine safety token to Romulus J. Markins, who has worked in the mine for 35 years without a disabling injury.

• Left to right: Monroe J. Mechling, a representative of the employees, and Howard Hanks, Alpha's vice-president.

No. 2 Self-Loader Added To Permanente Fleet

Permanente Cement Company announces that the *S.S. Santacruzcement* has been added to its fleet of bulk cement ships,to coincide with the reopening of the company's Duwamish distribution plant in Seattle.

S.S. Santacruzcement is one of the only two self-loading, bulk cement cargo ships on the Pacific Coast. The other, *S.S. Permanente Silverbow*, is also operated by the Permanente Cement Company.

The new ship, which was formerly operated by the Santa Cruz Portland Cement Company, has a cargo capacity of approximately 40,000 barrels of bulk cement, and is equipped with a Fuller-Kinyon pneumatic cargo-handling system which forces the cement, by air pressure, from the holds into shore-side silos in less than 24 hours. The vessel was leased to Permanente by the Santa Cruz company.

The Duwamish plant has a battery of 8 bulk silos, with an 80,000 bbl. capacity; it is serviced by the two ships, whose combined capacity exceeds 90,000 barrels.

• Alpha Cement Company's prize-winning Ironton mine employees.

A.I.M.E. Mid-Year Session Held at Columbus, Ohio, September 26—October 1

Of the 27 technical sessions arranged for the mid-year meeting of the American Institute of Mining and Metallurgical Engineers, held in Columbus, O., September 26 to October 1, many were devoted to mining geology, mining methods, minerals beneficiation, industrial minerals and extractive metallurgy.

More than 1,000 persons attended the mid-year session at which important speakers were lined up for the presentation of papers dealing with current problems of mining and metallurgy. All meetings were held at the Neil House and the Deshler-Wallick hotels.

The meeting was officially opened on Monday, September 26, with a welcome by Ohio's Governor Frank J. Lausche and Mayor James Rhodes. President L. E. Young responded for A.I.M.E.

The institute's board of directors also met in Columbus for their September session. Special activities were scheduled for the Women's Auxiliary by the Columbus section.

For those who wished to come early and stay late, blocks of seats had been purchased for the Ohio State University-Missouri game on September 24 and the Ohio State-Indiana game on October 1.

Arrangements were made to show outstanding mineral industries films. An all-institute luncheon was held on September 26, and the mid-year banquet on September 27. The banquet speaker was Dr. J. W. Barker, president of Research, Incorporated.

The following papers were of particular interest to those in the stone and cement industries—*Raw Material Economics of the Ohio Cement Industry* by R. J. Anderson, Battelle Institute; *Problems of Preparation of Limestone Samples for Spectographic Analysis* by Richard K. Leininger, Indiana Geological Survey; and *Petalite—a New Commercial Mineral* by John D. Clarke, Foote Mineral Company.

N.S.G.A. and N.R.M.C.A. Convention Plans Launched

Superlatives are said to be justified in commenting upon plans for the 34th annual convention of the National Sand and Gravel Association and the 20th such event for the National Ready Mixed Concrete Association, to be held January 23 to 27, 1950, at Chicago's Stevens Hotel, acknowledged this planet's biggest hostelry.

Arrangements already set in motion for the dual affair, which also includes an exhibit, suggest a show on the grand scale. Information on the facilities, services and equipment available at the Stevens for exhibits, an exhibit questionnaire, and an application for display space have been sent to each member of the association. Vincent Ahearn, executive secretary, urges members to inform headquarters of their requirements.

National Safety Congress To Be Addressed by Nation's Top Businessmen

Talks by important business leaders in some of America's largest companies will highlight the program of this year's National Safety Congress and Exposition, to be held in Chicago October 24-28.

Nearly 12,000 safety-minded persons from all corners of the United States and from Canada and other parts of the world will meet in Chicago for five jam-packed days at the 37th annual convention of the National Safety Council.

They will hear such outstanding businessmen as Gustav Metzman, president of the New York Central System; James Tanham, vice-president for industrial and public relations of the Texas Company and chairman of the board of directors of the National Safety Council; James E. Trainer, vice-president of Firestone Tire and Rubber Company; and Earl E. Moore, vice-president for industrial relations of the Carnegie-Illinois Steel Corporation.

A feature of the Congress will be a labor-management safety symposium on what can be done by labor organizations and industry to reduce off-the-job accidents. Labor's viewpoint will be presented by James L. McDevitt, president of the Pennsylvania Federation of Labor, A. F. of L., and Harry Read, executive assistant to the secretary-treasurer, Congress of Industrial Organizations.

There will be more than 200 Congress sessions on all phases of safety, and more than 500 program participants will take part in the discussions.

A display of radiological protective equipment by the Oak Ridge National Laboratory of the U. S. Atomic Energy Commission will be a part of the industrial exposition in the Stevens hotel.

Mississippi Lime Co. Men Take on Community Project

Public-spirited members of the Mississippi Lime Company's personnel at Ste. Genevieve, Mo., took on a big volunteer project this summer when they voted to help develop a 35-acre community recreational area made available by the company.

They donated week-end hours and spare tnme to clearing the area with bulldozers and other company equipment. First major project is construction of levees and spillways for a lake to cover about 3½ acres. Later this artificial lake is to be stocked with fish. It is expected that the picnic and barbecue facilities of the grounds will be in readiness this fall and the whole project next spring.

Safety Awards Celebrated By 350 at Safety Picnic

Employees of the Ideal Cement Company's plant at Superior, Neb., and their families enjoyed a "safety-picnic", something new in outings, at the city's Brodstone Memorial Football Stadium last July. More than 350 persons attended the luncheon and program.

After the crowd had witnessed a magician's act, the formal presentation of the Charles Boettcher plaque was made to the plant personnel by Cris Dobbins, Ideal executive vice-president and general manager. This award, the Portland Cement Association award and a citation from the Joseph A. Holmes Safety Association were accepted for the employees by F. G. Meyers, superintendent of the Superior plant.

Canadian Cement Famine Sends Foreign Imports Up

The cement shortage is currently still severe in the vicinity of Hamilton, Ont., according to recent reports. Because of huge priority orders of cement for the Hydro-Electric Commission projects throughout Ontario, coupled with a growing building boom, Canadian-made cement is almost unavailable.

In one week about 200,000 bags of German cement were unloaded at Hamilton, Ont., to ease the shortage. Dealers are also using Belgian, British and American cement in an effort to fill the unprecedented demand.

Breen Elected President Of Canada Cement Company

J. M. Breen was recently elected president of Canada Cement Company, Limited, succeeding the late F. B. Kilbourn. A graduate engineer of the University of Toronto, Mr. Breen joined the company as technical engineer in 1922. He was appointed chief of the technical staff in 1934 and became assistant general manager in 1947. The following year he was elected executive vice-president and general manager.

Mr. Breen established himself as one of Canada's foremost athletes in rugby and baseball after his return from serving in World War I. Subsequently he became equally well known as a rugby coach with the University of Western Ontario.

J. M. Breen

N.S.G.A. and N.R.M.C.A. Announce Plans for 4th Annual Short Course

Advance information on the program planned for the fourth annual short course of instruction for industry technicians, to be held November 14 to 19 at the University of Maryland, indicate that the sponsoring groups—the National Sand and Gravel Association, the National Ready Mixed Concrete Association and the University of Maryland—have prepared an interesting curriculum.

The following is an outline of the tentative schedule:

November 14—Morning: Registration, opening addresses, a preview of the course and a general discussion of problems of quality control of concrete in the field. Afternoon: Demonstration of laboratory tests of aggregates and discussion of problems of aggregate gradation and allied problems.

November 15 — Morning: Lectures and discussion of basic concepts involved in proportioning concrete and predicting its characteristics. Afternoon: Lecture on air-entraining concrete; review of and exercises in problems of determination of batch weights, yield, etc.

November 16—Morning: Lecture on design of concrete and class exercises (in groups). Afternoon: Demonstrations of laboratory tests of concrete and session on advanced concrete mixture design.

November 17—Morning: Lecture on sampling and testing concrete and discussion on control of ready-mixed concrete. Afternoon: Review of laboratory tests of bituminous mixtures and lectures on factors affecting the quality of such mixtures.

November 18 — Morning: Problem sessions on mix design, grading, air entrainment, etc. (in groups). Afternoon: Lectures on miscellaneous uses of aggregates, identification of rocks, etc, and general discussion of aggregate specifications

November 19—Morning: Final examination and presentation of certificates.

Stanton Walker, director of engineering for the associations, urges members to send in their registration blanks, in order to facilitate completion of program plans.

Denver Firm Rushes Work On Big Dam Contract

Production at the newly-installed Foss quarry north of Golden, Colo., operated by Denver Crushed Stone, Inc., recently reached 40 carloads per day. The plant's output of basalt aggregate goes to construction work on the big government dam being built for flood control on the Republican River in Harland County, Neb.

Because of the heavy truck traffic and switching railroad cars, as well as blasting operations, the company has posted signs prohibiting visitors and tourists from entering its premises.

N. C. Cement Commission Asks Further Exploration For State Plant Site

Following a two-day hearing on the advisability of establishing a North Carolina state-operated cement plant within the State Highway and Public Works Commission, the State Portland Cement Commission submitted a preliminary report to Governor Scott on September 1, recommending that an engineer be employed to make further exploratory studies of raw materials in certain sections of the state.

E. R. Hanford Sr., of Burlington is chairman of the commission and author of the bill passed by the 1949 North Carolina Legislature which created the study group.

The report to the governor specifically asked for investigation "to ascertain the extent, depth, continuity, and quality of the marl beds in the Coastal Plains areas, particularly around Castle Hayne and along the Trent River," and for studies "to determine beyond reasonable doubt whether the limestone occurring in the general areas of Murphy, Marion, and Kings Mountain are of suitable chemical character for acceptable portland cement."

Dr. E. Willard Berry, head of the Duke University department of geology, and G. W. Moore, consulting engineer of Sumerville, S. C., were recommended to conduct the studies, provided that no suitable persons are available within the highway commission.

The North Carolina study commission recommended that if adequate sources of limestone or marl be found, an effort be made to find a suitable complementary clay or shale for cement manufacture in the same locality. It was further recommended that all consideration of plant location be deferred until further exploratory studies have been made.

Geologists heard by the commission included Dr. Jasper L. Stuckey, head of the department of geological engineering at North Carolina State College, and state geologist; Dr. Poole Maynard, industrial geologist for the Atlantic Coast Railway, Atlanta; Joel H. Watkins, consulting geologist of Charlotte Court House, Va.; F. H. H. Calhoun, consulting geologist for the Seaboard Air Line Railroad, Clemson, S. C.; and Dr. Berry and Mr. Moore.

Statements by these geologists indicated there was little likelihood of finding suitable sources of limestone in the western part of North Carolina and that the best known source appeared to be in the Coastal Plains area, notably in and around New Bern and Castle Hayne.

On the basis of the testimony presented, the study commission concluded in its preliminary report that "at the present state of knowledge it seems unlikely that all raw materials—limestone, clay and fuel— will be found in the same location. Of the materials that the geologists believe have commercial and economic possibilities, only the shale deposits of the Sanford area and the coal of the same area seem assured. Of the limestone deposits, the geologists indicate that from surface observations and shallow operations, adequate supplies of marl are available but must be proven by exploration."

Conco Limestone Company of Fort Worth, Tex., amended its charter August 18, 1949, changing the purpose clause and altering its name to Limestone Sales Company, Inc.

Rock Crushing Plant Built By Great Northern R.R.

Granite Falls, Minn., has finally found a market for its rock. The Great Northern Railroad has located its new rock crushing plant there. The Green Construction company of Spokane, Wash., set up the reduction plant to supply crushed rock for ballast on the main line from Minneapolis to Seattle.

The Great Northern, which owns a similar plant at Essex, Mont., plans to operate the crushers at Granite Falls for at least 15 years. Superintendent of the Granite Falls plant is C. F. Ohliger. Foreman W. A. Groves, Timekeeper F. David Slee and Mr. Ohliger were sent to Granite Falls from Spokane by the Green company.

One large crusher and two smaller ones are needed to reduce the rock to ballast size. Granite is blasted from the hills and shuttled into a large jaw crusher. Here the rock is broken to 10-in. size and under.

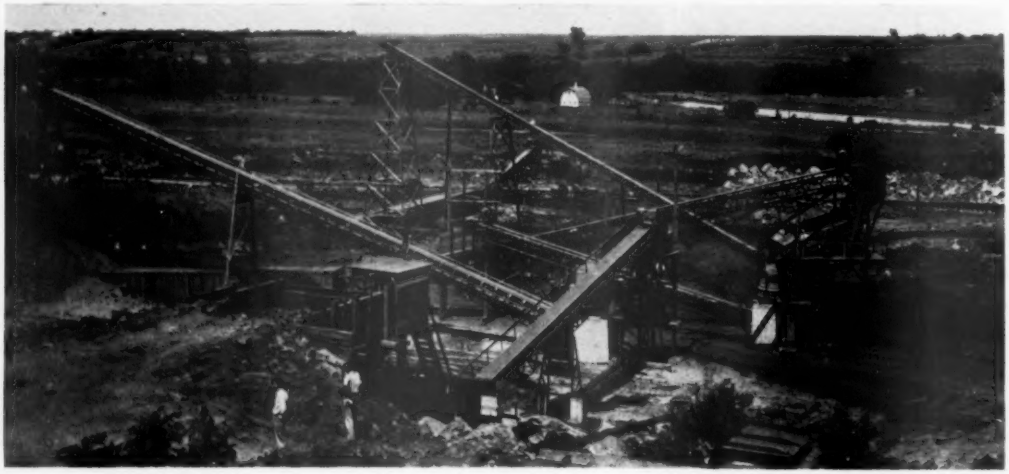
• Supt. C. F. Ohliger watches operations at the second crusher.

• Below: General view of the Great Northern's plant at Granite Falls.

A conveyor belt 36 in. wide and 90 ft. long moves the rock to a second crusher, where it is reduced to 2-in. size. From here most of the rock is taken, via conveyor belts, to empty railroad cars. Some of the rock is taken to a third crusher, which reduces it to ¾-in. size. The regular ballast rock is used immediately, while the smaller sized rock is stock-piled for use at a later date.

From Granite Falls the rock goes to Willmar, Minn., a division point on the Great Northern's main line. From there it is sent to the ballasting operation.

At present the crushers reduce three carloads of rock per hour. Only one 8-hr. shift is worked each day, but plans call for two more shifts to be added later. Fifteen men are employed in the present shift.



30 years ago in Pit and Quarry

By WALTER E. TRAUFFER

THE October, 1919, issue of PIT AND QUARRY was chock full of good advice on various topics of vital interest to nonmetallic minerals producers then and now. Outstanding was the feature editorial "Give your Association a Paid Secretary," by editor E. S. Hanson. Briefly and clearly Mr. Hanson pointed out that an association, "in order to have the greatest success, must have someone whose sole business it is to promote the interests of the organization." The advice given is just as good today and for that reason the editorial will be reprinted in the November, 1949, issue of PIT AND QUARRY.

Also important to many producers was the information on "How to Get a Side-Track," an article written especially for PIT AND QUARRY by Ben Stone, business director of the Illinois Sand and Gravel Producers' Assn. Changing conditions in the 30 intervening years, however, make it inadvisable to apply his then sound advice to present problems.

"Comments Upon Bonus Systems" by D. J. Hauer, associate editor, was a thorough discussion of a subject which is just as important to industry now as it was in 1919. A difference, however, is that the subject was new and comparatively untried then and was probably regarded by most industrialists as a step toward socialism or worse. Now the practice is widespread and successful in varying degrees up to the spectacular, depending on the type of plan used, the intelligence with which it is administered, and the nature of the industry to which it is applied.

Mr. Hauer obviously brought to this subject a clear insight into human nature, a thorough understanding of the minds and attitudes of working men, and a wide familiarity with production and the problems of plant owners and operators. His analysis of the subject and advice on the establishment of a bonus system applies, with minor variations, equally well to present conditions. He also points out why such systems were particularly difficult to apply to the crushed stone and related industries, as they still are, and told how to overcome many of these difficulties. This article was so outstanding and is so timely now that it will be reprinted in full in an early issue.

Another lead article in that issue 30 years ago pointed out the importance of requiring a road contractor, in submitting an estimate, to state from what source of supply he expects to get his materials. It was suggested that deposits not already known to be suitable could be investigated and approved or rejected in order to insure better results on road work. The state highway departments were suggested as the logical ones to do this work. Now nearly every known deposit in most states has been so tested and is on record.

An interesting report stated that postwar building material prices and construction costs had reached their peak. It was pointed out that if the cost of living and wage scales could be stabilized, the country could enjoy many years of prosperity.

A report from the Department of the Interior stated that the total value of all minerals produced in 1918 was $5,526,000,000, more than a half-billion dollars above 1917, but the total quantity produced was less. The production of metals, coal and oil was up, but that of building materials—clay products, stone, cement, lime, gypsum—was down considerably.

One of the many new agricultural limestone plants built since World War I, that of the A. C. O'Laughlin Co., near Bellwood, Ill., was completely described in this issue. This outstanding plant had among its equipment a 6- by 50-ft. Allis-Chalmers rotary drier, a 6- by 6-ft. ball mill and a 5- by 20-ft. tube mill. A 90-percent through 200-mesh product was bagged in a 2-spout Bates machine.

Public Building Contracts Show Upward Movement In 37 Eastern States

Expenditures authorized for building and engineering works by government agencies continued upward last month with a contract volume of $410,352,000 in the 37 states east of the Rocky Mountains, it was reported today by F. W. Dodge Corporation. Public-account contracts represented 43 percent of all awards reported in July. The overall total of private and public-account contracts awarded last month was $943,560,000.

The month's mounting volume of public-account work continued the trend characteristic within the industry this year. July awards by public agencies reflected a 9 percent gain over June and a 23 percent increase over July of last year.

Public-account nonresidential contracts amounted to $149,519,000 during July and represented 43 percent of all nonresidential awards. July's public-account nonresidential volume was up 6 percent over June and 15 percent over July of last year, with a cumulative seven-months advance of 21 percent.

Public-account residential awards in the 37 states amounted to $33,404,000. This total was 10 percent of all residential awards reported during the month. The July public-account residential contract total was off 13 percent from June but up 174 percent over July of last year.

Frank Baumgardner Retires After 38 Years of Service

Frank Baumgardner, well known chief power engineer for Marquette Cement Manufacturing Company, retired this fall after 38 years of service with the company. It is understood that he will be retained by Marquette on a consulting basis at such times as his services may be needed on special company development projects.

Frank Baumgardner

Mr. Baumgardner joined Marquette on March 2, 1911, as assistant power engineer at the company's Oglesby, Ill., plant. Within a few months he was promoted to the post of chief power engineer there.

In 1924, when Marquette acquired the cement producing plant at Cape Girardeau, Mo., Mr. Baumgardner was named over-all chief power engineer for the company. He held this post through succeeding years, during which Marquette developed into a five-plant organization.

Fluorspar Now Processed In Old Colorado Gold Mill

Operations at the Mahoning Mining Company's Blue Jay fluorspar mine in the Jamestown, Colo., area recently went on a two-shift production schedule. The firm also operates two other mines in the vicinity—the Emmett, 760 feet deep, and the Argo—both on a single-shift day.

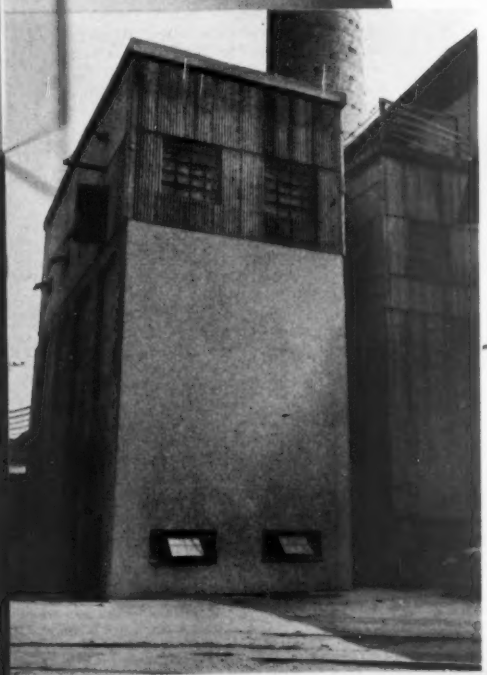
The spar is processed in a 40-year-old converted gold mill, the Wano. Here 80 to 100 tons of ore is handled per day. The mill is operated on a round-the-clock basis. Last year's mill product was worth about $1,000,000 on the market at $45 per short ton. Production this year is expected to be about 20,000 tons.

Vernon Cobb is foreman at the Argo and Emmett, and B. D. Lott is Blue Jay foreman. Superintending milling operations for Mahoning is Ernest G. Ovitz. V. C. Hays is plant foreman.

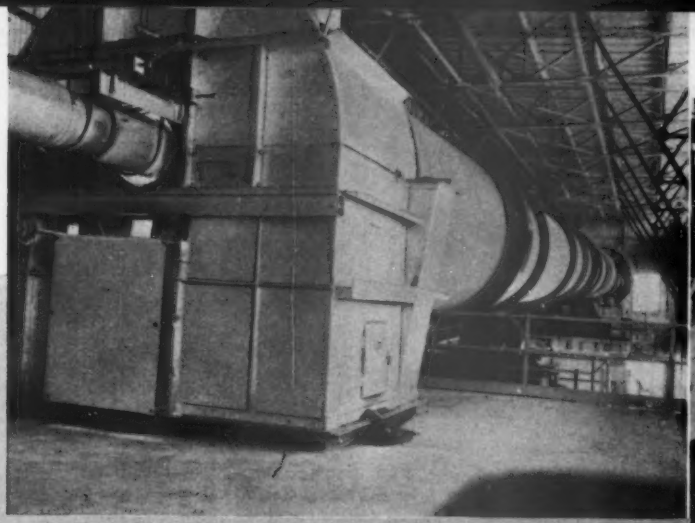
A view of the building which houses the new 10- by 380-ft. rotary kiln at Alpha Portland Cement Company's Lemay plant near St. Louis. This 2,500-bbl. kiln replaces two smaller units which were not connected to the original precipitator.

Dust Recovery

BY
WILLIAM M. AVERY



The new Cottrell electrical precipitator operates in parallel with the original unit (at the right), which was installed in 1937. The two exhaust to a 300-ft. concrete stack.



Above: A view of the 10- by 380-ft. kiln from the burner platform. The burner pipe into the kiln is bustled with a 19-in.-diameter stainless steel pipe to increase its service life by air cooling.

Right: The new kiln may be fired either with natural gas or with pulverized coal from this direct-firing coal mill.

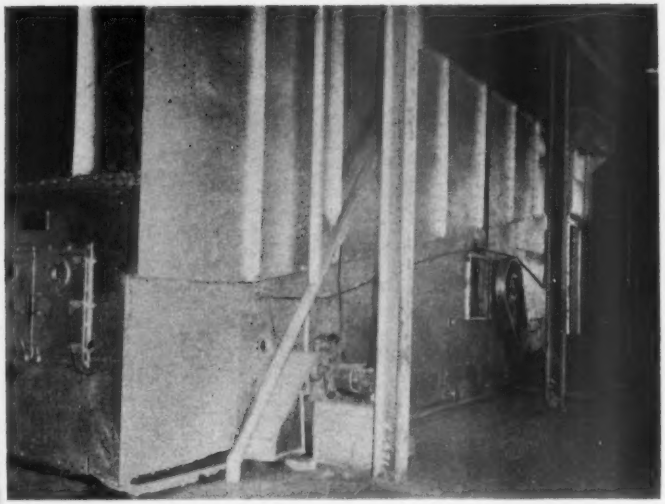
Second Precipitator Unit at Alpha's St. Louis Plant Achieves 98% Recovery —New Long Kiln Replaces Two Old Units

IN ORDER to reduce the amount of dust discharged from the stack of its wet process cement plant at Lemay (St. Louis), Mo., the Alpha Portland Cement Company, in conjunction with a general improvement program, has recently placed in service the second unit of a Cottrell precipitator, more than doubling the capacity of the dust collecting system. The original precipitator unit was installed in 1937, when four of the six 170-ft. kilns were rebuilt, with enlarged burning zones being added to two of them. This gave the plant two 10- by 8- by 230-ft. kilns with a capacity of approximately 2500 bbls., and a reserve capacity of 1500 bbls. represented by the two old kilns which were not enlarged. The Cottrell precipitator was installed to handle the exhaust gases from the two enlarged kilns, but the reserve kilns were not connected to the dust collecting unit.

For the past year or two it had been necessary for the company to operate the reserve kilns under the severe handicap of high fuel consumption and dust throw-off. To correct both conditions it was decided over a year ago to replace the old reserve kilns with a new long kiln, and to increase the capacity of the dust collecting system to handle the new burning unit. The new 10- by 380-ft. wet-process kiln, designed and built by F. L. Smidth, has a capacity of 2500 bbls. daily.

The new dust collector unit was placed in service in March of this year. In actual tests carried out by engineers of Western Precipitation Corp. it was found that 98 percent of the dust load in the system was recovered when all three kilns were in operation. The tests, which followed standard dust determination procedure, also revealed that the system was collecting approximately 38½ tons per day from the exhaust gases of the three kilns. This amounts to approximately 3 percent of the total material which passes through the kilns.

Like the original unit, the new precipitator is of the rod-curtain type, consisting of two passes with four compartments in each pass. The



Clinker from the new kiln discharges over this inclined-grate, air-quenching clinker cooler.

electrodes are ⅛-in.-square twisted rods, suspended loose in the top header and guided by two sets of "U" spacer bars to prevent swaying. The entire system is arranged to maintain the electrodes in correct alignment and to center the discharge electrodes betwen the collecting curtains.

The collecting electrodes are composed of ⅛-in. pipes attached to the angle headers. These are so spaced as to form ducts through which the dust-laden gases must pass. In operation the discharge electrodes are charged negatively at a potential of about 50,000 volts, thus becoming the means by which gas in the precipitator is ionized and the dust particles are charged. The collecting electrodes are grounded and the negatively-charged dust particles deposit on the surface of the curtains until they are dislodged by rapping. Although the collecting electrodes gather the heaviest load, the discharge electrodes also gather some material.

The new unit incorporated an air-operated rapper with three timers—cycle, program, and pulse. The latter determines the number and length of impulses to the collecting rapper solenoid. An air pressure chart makes a visible record which shows definitely whether or not the mechanism has been rapped. A damper in the new unit automatically closes just before rapping begins and opens after the completion of the cycle.

About 90 percent of the recovered dust from all three kilns is fed back dry to the two 10- by 8- by 230-ft. kilns. This is done by means of vortex feeders which carry the dust into the center of the feed pipes, from which it enters the kilns with relatively little mixing.

Below, left: The kiln is driven by a 150-hp. motor through two flexible couplings and a gear reducer. Note the floating girth gear.

Below, right: The new kiln rests on five supporting piers. All trunnions ride in an oil-and-water bath.

Dust Mill The 10 percent or less of recovered dust which cannot be fed dry is mixed with slurry and water and refed in that form. This is done in a 3- by 6-ft. tube mill which was built in the plant shop. The mill is loaded to about one-third of its depth with 1-in. diameter steel balls, and the dust, slurry and water are fed through the trunnion. The mixture of dust and slurry is discharged through slots into a tank from which it is pumped to the kiln feeder tanks.

Although it was wholly experimental at the outset, the dust mill has been most satisfactory since it was placed in operation in April of this year. Prior to that time it had been necessary to discard the portion of the dust which could not be refed at the vortex feeders. The capacity of the mill is such that all of the dust could be mixed with slurry if it were desirable to do so. In operating the dust mill every effort is made to add as little water as possible.

New Kiln The new F. L. Smidth all-welded kiln rests on five supports, and all the trunnions ride in an oil-and-water bath. It is equipped with a Fuller inclined-grate cooler, and it may be fired with natural gas or with pulverized coal from an E-56 Babcock & Wilcox direct-firing coal mill. The kiln slopes ½ in. to the foot, and is lined in the burning zone with 70-percent alumina brick. Standard liners are used in the remainder. The Smidth chain system starts 11 ft. from the feed end and extends for about 55 ft. of the kiln length.

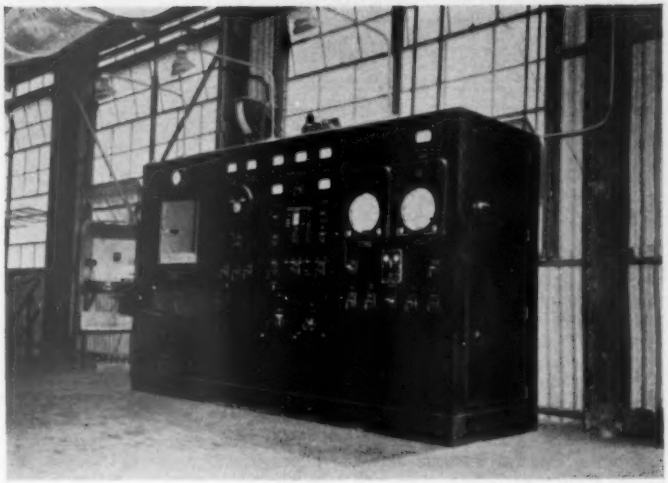
Drive Motor The kiln is driven by a 125-hp. d.-c. motor through two flexible couplings and a Philadelphia gear reducer, and it is equipped with an automatic brake to prevent back-up, as well as an automatic cutoff actuated by the thrust rollers. The drive motor is controlled by a rheostat to kiln speeds ranging from 20 to 100 r.p.h., although under normal conditions the speed is held constant at about 75 r.p.h. Initially the kiln drive was synchronized with the ferris wheel feeder motor, but the feed control is now independent. As protection against damage to the kiln during power interruptions, there is an auxiliary gasoline engine on the drive platform.

Coal Mill The B & W direct-firing coal mill, located below the firing floor, is direct-driven by a 125-hp. motor. Primary air is supplied by a separate fan (direct-driven by a 100-hp. motor) which draws from the kiln hood. An air-tempering damper in the line from the kiln hood to the fan automatically holds the temperature of the primary air to 400 deg. F. The coal-air mixture leaves the mill at about 150 deg. F. The primary air is held as close as possible to 25 percent (by volume) by controlling the level of coal in the mill.

The mill has a capacity of 18,000 lbs. of coal per hour, as against an actual average consumption of approximately 12,000 lbs. per hour, the rather liberal margin being regarded as a desirable hedge against the occasional necessity of grinding very wet, low-grade coal. One of the features of the mill is a tramp iron collector which can be cleaned without shutting the mill down. The mill has the standard B & W pulverizer feed controller. Included as auxiliary equipment is a 10-ft. cyclone which removes clinker dust from the primary air stream and discharges it on the conveyor from the Fuller cooler.

The 13¾-in. burner pipe into the kiln is bustled with a 19-in. stainless steel pipe, both of which had been in service for six months at the time of our visit. This unusually good performance is attributed to the cooling effect of air drawn between the two pipes by the kiln draft.

Clinker Cooler The 6- by 33-ft. Fuller air-quenching clinker cooler is equipped with sectional wedge-type grates which are one foot in width. Clinker delivered to the cooler at 2000 to 2100 deg. F. is discharged at a maximum temperature (for large particles) of 200 deg. F.



The centralized control cubicle on the burner floor. The installation has an unusual number of automatic controls.

The temperature of the secondary air going from the cooler to the kiln is automatically held at about 1100 deg. F. by means of a thermocouple control which increases or decreases the speed of the cooler drive as the heat of the air goes above or below that level. The cooler is divided into a primary and secondary zone by an arch suspended from the roof. Thus about half the air forced through the grates goes to the kiln as secondary air, while the remainder is exhausted through the cooler stack. There is a baffle-type dust collector connected to the vent pipe from the secondary side of the cooler. The dust collected at this point is discharged onto the drag chain which conveys clinker from the cooler to the yard pit. The cooler has a centralized greasing system.

Controls All instruments and controls for the new burning unit are located on the burner floor. Ammeters show the loads on all the motors in the installation, and indicator hands show the speed of the kiln and of the slurry feeder. Visible signals light up in the event of a motor failure anywhere in the system, and there is a blinker light to indicate slurry feeder tank overflow.

Burning zone temperatures, feeder and kiln speeds and hood and back-end drafts are all recorded automatically. Of particular interest is a continuous oxygen analyzer and recorder which automatically adjusts the fuel-air ratio to maintain an optimum 1½ percent of oxygen in the exhaust gas stream. Kiln draft may be controlled automatically or by hand from either the hood draft or the back-end draft by Bailey pneumatic drives on the dampers.

When the B & W mill is in service, changes in fuel requirement are effected automatically by varying the amount of primary air put through the mill. A pilot tube in the duct of the hot air system measures primary air differential, and the 150-degree temperature is maintained by a thermocouple in the pulverizer discharge line. The desired 400-degree temperature on the suction side of the pulverizer is maintained by means of a damper valve. As a final provision for assuring the ultimate in control, the entire system is interconnected by telephone lines between the burner platform, the rear of the kiln, the raw silos, and the laboratory.

Output The new kiln is operated to produce about 2250 bbls. per day. Although on the face of it the kiln capacity of the Lemay plant is now 5000 bbls. as a result of the program just completed. Production is limited by the raw and finish grinding departments to 4500 bbls. daily.

In addition to improving fuel consumption by increasing the length of kilns, the company is now able with entire truth to state that it has done everything possible to reduce the dust discharge from its kilns. From our own personal observations we would say that an outstandingly successful job has been done.

J. F. Loveridge is superintendent of the Lemay plant. E. F. Brownstead, general superintendent of Alpha's western plants, also makes his headquarters at St. Louis.

WASHINGTON NEWS LETTER

another P.Q. exclusive

THE construction industry is coming in for a great deal of attention in Washington these days. The reasons are twofold: (1) Washington has been surprised to discover that while most of the economy has slid backwards over the last year, the construction industry has continued to go forward; (2) Washington is watching with great interest to see how the recently passed Housing Act is working out.

The Federal Reserve Board devoted most of the space in its latest monthly *Bulletin* to a discussion of "Construction Markets in 1949." What the Federal Reserve Board thinks about this matter is of real significance because its evaluations are regarded seriously by the entire banking system. It can have an important effect on the availability of construction loans and thereby on the volume of construction.

The Board found that "the physical volume of new construction has increased more than seasonally from the low winter levels" and that "recent construction contract awards indicate that construction activity is likely to continue to expand moderately in the near future."

The Board also reviewed the question of construction costs and found that they have declined in recent months, and that in the first half of this year they were just about the same as in the first half of 1948. Both material and labor have been in ample supply. While material costs have fallen somewhat, wage rates have risen further in the Spring of 1949. However, the Board concludes that higher wage rates have not meant higher labor costs. It points out that with a larger labor force "overtime work at premium rates has been reduced," and "delays caused by shortages of materials have been largely eliminated."

The net effect is likely to be lower construction costs in the future and lower prices, particularly for housing. In addition to the factors mentioned above, the Board believes that housing costs will come down because mortgage money is easier to secure and interest rates are falling. More lenders are finding the 4 percent interest rate on veterans' loans and the 4½ percent interest rate on FHA loans attractive.

One other factor is contributing to the declining cost of new housing. It is that builders are taking lower profit margins. There are no

By S. HERBERT UNTERBERGER

official figures on this, but the informed estimators say that the figure is now down to 10 percent and still falling.

The Federal Reserve Board has something to say about the new Housing Act, as well. It warns that not too much is to be expected from it this year. Some land acquisition and planning will take place. But it is unlikely that any appreciable amount of construction under the Act will occur before next Spring. Beginning then, however, a substantially increased volume of public residential building is expected.

One aspect of the Housing Act is furnishing great amusement in Washington these days. It is the sight of congressman who fought vehemently and vigorously against that law now entertaining delegations from their home districts who are in Washington to requests funds for housing projects. These anti-housing congressmen are now arranging meetings with the home town folks.

The Chicago Federal Reserve Bank, in a recent publication, went into the subject of the effect of the Housing Act of 1949 even more fully. It pointed out that, "public housing and whatever other kinds of building may result from slum clearance are likely to incline toward the 'heavy construction' type. At least, such contracts will have to be let to contractors who are organized to handle large projects of the 'brick and steel' kind." Therefore, the small homebuilder — whether of the speculative or custom type—is not likely to feel that the program will help him directly. In fact, he has some reason to belive that a public housing development of the size here contemplated, on the one hand, will undermine a part of his potential market, and, on the other, prevent needed cost reductions by keeping prices of materials and labor at high levels. Reduced costs of private builders are essential in minimizing the need for still more public housing.

Public housing advocates maintain: (1) that the market they serve is not a part of the potential market of private builders, and (2) that the total stock of housing would not be affected by slum clearance low-rent housing because new units would be accompanied by equivalent demolitions. If experience shows these claims to be well founded, many businessmen may well adopt the attitude that the new Federal housing program assures a high level of construction, which in turn will have beneficial effects upon general business and employment. It should be pointed out, however, that all public housing under the expanded program will not be of the slum clearance kind, and that therefore some net addition to the total housing stock probably will occur.

It might be appropriate at this time to ask, "What effect will all this have on the demand for the products of the pit and quarry industries?" It has already been pointed out that the slum clearance program will tend toward the heavy type of construction. This is the type which is more likely to use pit and quarry products, of which cement might be the best example. In addition, however, the recent trend has been toward a greater volume of public construction (25 percent greater than last year) and a lesser amount of private construction (5% below last year). Similarly, public construction is generally of the heavy type. It is dominated by large buildings, including schools and hospitals, sewerage and water facilities, and highway construction and maintenance. These are all large consumers of pit and quarry products.

Income by Regions

A year ago, on this page, we reported on how the wartime and post-war prosperity had developed in each region of the country. As a measure of prosperity, we used the volume of income payments to individuals, because rising individual incomes means prosperity and falling incomes means hard times. Data just released make it possible to bring that story up to date.

Total Income Payments to Individuals by Region

Region	Percent Increase in Total Income Payments 1940 to 1944	1944 to 1948
New England	+ 75	+ 28
Middle East	+ 73	+ 35
Southeast	+137	+ 30
Southwest	+137	+ 33
Central	+ 93	+ 42
Northwest	+123	+ 41
Far West	+149	+ 22
Total U. S.	+100	+ 34

This table shows how the wartime and post-war prosperity was dis-

(*Continued on page* 74)

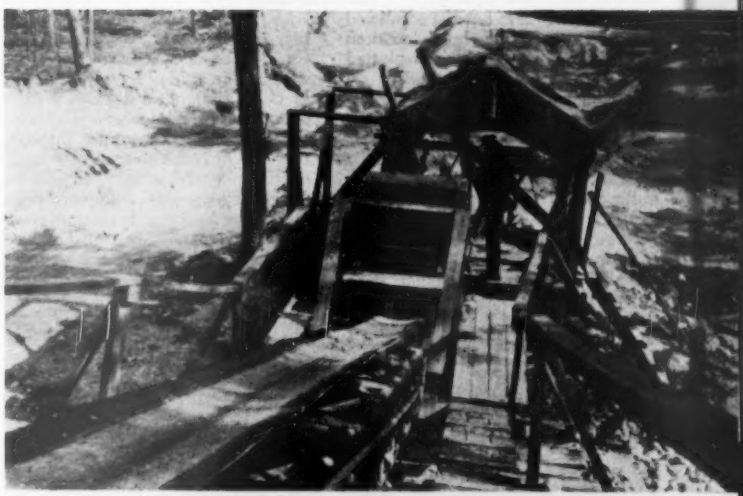
• The central washing plant for the feldspar operations of the Appalachian Minerals Company, Monticello, Ga. Pit run ore is trucked to the head of this plant from several other mines.

Feldspar From Jasper County

THE discovery and subsequent full-scale mining operations of an unusually rich deposit of feldspar near Monticello, Ga., has lent considerable weight to the arguments of Georgian industrialists fighting to bring the large ceramic and glass companies into the South. With large available quantities of kaolin, quartz, and now feldspar, Georgia has better than 85 percent of the raw materials needed by a manufacturer of pottery, china, or glass. To these men, construction of new finishing plants in the Southeast now makes good economic sense.

How the Georgia feldspar deposits were discovered makes an interesting story.

The pegmatites of Jasper County produced a small amount of mica in World War I. In World War II, our government's search for this strategic mineral brought to Georgia B. C. Burgess, then Southern manager for Colonial Mica Corporation. Along State Highway 83, near Monticello, Mr. Burgess observed crews repairing the road with a graphic-granite type of feldspar. In 1944, after severing his government connection, he investigated the source of the graphic-granite type of material noted on his previous visit. By 1946 he had uncovered enough feldspar-bearing ore to warrant commercial development of the property, and in 1947 he conveyed his leases and interest to Appalachian Minerals Co., remaining with it as



• Ore is pulled into the washing plant by a scraper bucket propelled by a double drum hoist.

• Right: This double drum hoist is powered by a 25-hp. internal combustion engine using tractor fuel.

vice-president and general manager.

The Appalachian company holds leases on deposits covering a 10-mile area in Jasper County. According to Lendall P. Warriner, president, the relative richness and quantity of the ore will permit a dry recovery for at least 10 years before it is necessary to switch to the more expensive flotation processes for beneficiation of the lower-grade ores.

Since the pegmatites decompose less rapidly than the enclosing gneisses, they usually stand out as substantial hillocks and almost invariably outcrop on higher ground. Feldspar and graphic granite "float" mark these elevations and hillsides.

Development Prospecting methods are simple. When the presence of float indicates a pegmatite, a base line as nearly as possible conforming to the long axis of the body is run out. Transverse lines are spaced at 50-ft. intervals and are picketed out at right angles to the base line well beyond the estimated boundaries of the body. Four-in.-diameter soil auger holes are bored on these lines at measured intervals, with the hole locations and identity of the cuttings plotted on a base map. The soil and gravel from the pegmatites is virtually impenetrable, while the decomposed gneiss is penetrated easily. The outlines of the body, and occasionally even the direction of dip, can be quite accurately determined by this method.

Removing overburden and loose outcrop material by bulldozer is the second stage if the soil auger work indicates a sizable pegmatite. As little as possible of the loose pegmatite is pushed off, as this material yields a high recovery of feldspar when washed and screened.

• B. C. Burgess and Lendall P. Warringer, vice-president and president, respectively, pose for this shot along with Mrs. Kathryn B. Benton, office manager.

Detailed geological mapping follows, accompanied by shot drilling to determine the attitude and thickness of the deposit. The broken and blocky nature of the ground makes diamond drilling prohibitively expensive, with core recovery hardly better than 10 percent. Shot drilling, on the other hand, makes up for its lack of speed by eliminating time lost in fishing for lost core and in other difficulties attendant upon diamond drilling in broken ground. Furthermore, because the information sought is not so much the tenor of the pegmatites as their dimensions, the high cost of diamond drilling is not justified by the information to be obtained. For example, contract prices for EX holes ranged from $2.50 to $3.50 per foot, with overburden on a cost-plus basis. The company, using an antiquated Sullivan Bravo machine and with inexperienced runners drilled 13 holes ranging in depth from 22 ft. to 69 ft. at an average cost of $1.20 per foot. No. 6 and 7 chilled shot made satisfactory progress through material that destroyed diamond bits in as little as ten feet.

By these methods, it is estimated that in excess of 750,000 tons of feldspar ore have been proven. Probable and possible reserves are several times that amount.

Mining The conventional hand method of working segregated pegmatites by sinking a shaft or open cut on feldspar-rich streaks has been discarded in favor of handling mine run pegmatite rock in a central washing and sorting plant. In this fashion, recovery of feldspar in the finer sizes is greatly increased at low cost.

Drilling and blasting practice varies with the individual deposit, but in general when a quarry face is established, 8 to ten 10-ft. holes are drilled by jackhammer on 4- to 6-ft. centers and 5- to 1-ft. burden. These holes are loaded with about ½ lb. per ft. of 30 percent extra gelatin dynamite and blasted simultaneously with No. 9 electric caps fired by a 20-hole battery. This loading tends to lift the area drilled, leaving it thoroughly broken yet with minimum fragmentation. The broken ground can then be scraped without the difficulty caused by oversize lumps or solid ribs.

A long narrow cut two benches (18- to 20-ft.) deep is advanced from 150 to 200 ft. from the scraper setup before side benching begins. Alternate cuts the full length of each side provide steady scraping without interfering with drilling.

• The broken ore is scrubbed and washed in a 9-ft.-long trommel screen which is surrounded by a dust jacket with ½- by 2-in. slotted openings.

• Left: One of the trucks taking on a load of raw ore. Note the shape of the bucket used to scrape the feldspar deposit.

• Left: The first step in the cycle of producing 20-mesh feldspar is crushing the washed ore.

• Right: Iron impurities are removed with the help of this roll magnetic separator.

Because electric power is not available at the mines, double drum Jaeger Model 2A3 hoists are used, powered by Allis Chalmers 25-hp. internal combustion engines using tractor fuel. The mining method makes it unnecessary to change the position of the tail block more than once in a shift; consequently the double drum hoists are adequate for the job and represent less capital outlay with more economical operation. These hoists haul a company-designed, partial box-hoe-type scraper with a 54-in. face, capacity approximately ½ ton, up a 20-deg. steel-rail-faced ramp, depositing the broken ore on a grizzly of 56-lb. rail on 10-in. centers over a 15-ton-capacity wooden bin. The broken ore is trucked to the head of a central washing plant located on another ore deposit. Here production can be made from trucked material or from the rock mined at the plant site.

At the washing plant an Austin Western 24-in. belt conveyor raises the broken ore to a 30-in. diameter by 9-ft.-long trommel screen with 1½-in. round openings, where it is scrubbed and washed. Trommel oversize passes to a sorting table mounted over an Austin Western 3-compartment, 20-cu.-yd.-capacity steel bin. The washed feldspar is forked into the outer compartments by two men, who also remove block mica to burlap sacks mounted under funnel-shaped wooden frames on the bin deck. A feature of the sorting table is its hinged construction which permits accumulated waste to be dumped into the inner bin.

A dust jacket with ½- by 2-in. slotted openings removes fines from the minus 1½-in. material from the trommel. The minus 1½-in. plus ½-in. is discharged from the jacket to a sorting table. Mica and quartz are removed by hand. Undersize from the dust jacket is flushed down a tail race by the wash water. The cleaned feldspar passes to the nearer of two five-ton capacity wooden bins, the waste quartz being placed in the other.

Mixed loads of plus 1½-in. and plus ½-in. are trucked to the grinding plant at the railroad, weighed on Fairbanks scales, to determine the royalty, and dumped into one of four 250-ton covered storage bins.

The products of the sorting plant from the two mines operated by this method and from two other mines where ordinary hand sorting is practised have given commercial feldspars of the analyses shown in Table I.

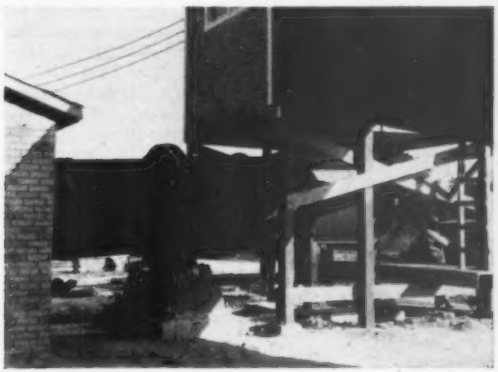
Table I

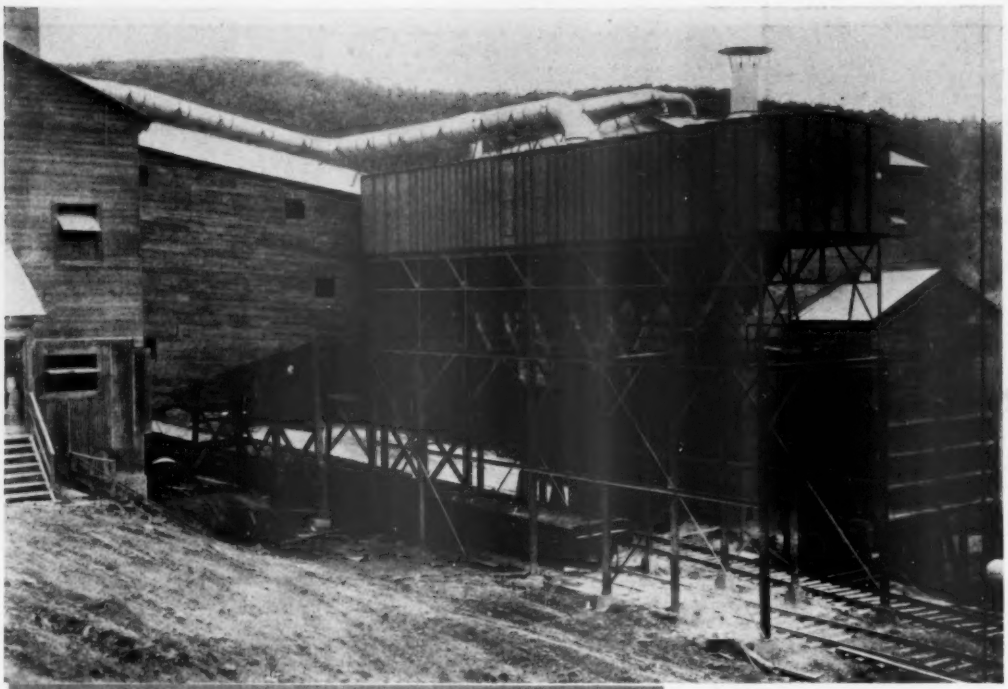
	Sample 26	Sample 37	Sample 38	Sample 47
SiO_2	71.80	69.50	68.00	69.30
Al_2O_3	16.53	17.51	18.43	17.63
Fe_2O_3	.07	.09	.07	.07
CaO	.20	.20	.10	.10
MgO	.04	.04	.04	.04
K_2O	9.45	10.44	11.80	11.30
Na_2O	1.84	2.28	1.57	1.50
Loss	.01	.14	.14	.14
Total	100.03	100.20	100.15	100.08

(*Continued on page* 74)

• Right: To keep down the dust, all of the vibrating screens in the grinding plants are completely enclosed.

• Below: Moisture content of the crushed feldspar is reduced to 0.5 percent in this oil-fired rotary kiln. Temperatures in the kiln range around 500 deg. F.





• A view of the dust collector bag house at the Duluth, Minn., crushed stone plant of Zenith Dredge Company.

• Dust is periodically drawn off from the collector system into these 8-ton bottles. It is used as filler material for asphalt mix.

• Right: Thor Berg, plant superintendent. During the summer months when the plant is operating at full capacity, Berg is responsible for the work of 60 men.

another ON THE SPOT report

THE Zenith Dredge Company of Duluth, Minn., bought the plant and property formerly owned by the Duluth Crushed Stone Company in 1945. Although this plant is the only one of its kind around Duluth, a metropolis of more than 100,000, its purchase appeared, at the time at least, like a highly speculative investmest. The plant equipment was old, having been designed and built around 1920 and, to make matters worse, sales had slipped in later years to a mere fraction of the plant's capacity.

Primarily, this stone plant was acquired by Donald C. MacDonald, dynamic president of Zenith Dredge, in order to strengthen his bid on a big breakwater job. It was not too surprising to those who are acquainted with any of the MacDonald enterprises that Zenith was awarded the Two Harbors breakwater job. This meant a 450,000-ton order for the stone plant. Happily, orders for railroad ballast zoomed up at the same time. The combination of orders for riprap and ballast boosted sales figures from a trifling 95,000 tons in 1946 to more than 323,000 tons in 1948.

Dust Collectors Although the plant was in reasonably good running order when it was taken over in 1945, it was, in

Effective Dust Protection for Men and Machinery

By EDWARD BRUNENKANT

common with a good many of the older crushed stone operations, excessively dusty. Prompted by a request from the Minnesota Industrial Health Commission, and bolstered by the fact that effective dust arresting made good sense to a management conscious of responsibilities to employees, immediate steps were taken to install a complete overall dust collection system.

A system developed by the Parsons Engineering Corp. was selected. Essentially this dust collector system consists of a series of oval bag dust arrestors mounted in a non-rusting case. The dust-laden air is drawn of from hoods at the discharge ends of all the secondary crushers and from similar partial hoods over the feed ends of the plant screens through ducts leading into the bottom of the bag house.

Gravity causes the heavier particles to settle into hoppers below the bags, while the finer dust continues upward through oval openings into the bag house floor into the oval filtering bags. The dust is collected on the inner walls of the bags while the filtered air passes through the bags out into the top of the bag house. Periodically, the bags are shaken out and the dust collected in the hoppers below. Approximately 40 lbs. of dust are collected for each ton of stone crushed in the plant. As Zenith Dredge Co. also operates a hot-mix asphalt plant, this dust finds a ready use as a filler material. It is drawn off into special 5-ton dust bottles (see illustration) which are set on a flat railroad car and pulled to the asphalt plant, a few hundred feet away, with the company's workhorse locomotive, a 75-ton Vulcan machine.

• Two diesel shovels busily engaged in loading well fragmented stone.

• Left: One of the 18-ton trucks dumps a load into one of the two primary crushers.

• Stone too large to be used for plant feed and too small for riprap is moved to one side of the quarry and broken up with a 6500-lb. drop ball.

Quarry Operation Blasting at this quarry imposes a rather difficult problem in view of the fact that the company must extract two sizes of stone—well fragmented rock for plant feed and large riprap for the breakwater project. The major problem is to secure sufficient numbers of plus 5-ton stone which forms the cap or covering layer of the breakwater. To cope with this problem two distinctly different blasting patterns are followed.

For well-fragmented stone, a multiple hole, single row (35-ft. burden and 25-ft. spacings) pattern is used. The holes are drilled with a Bucyrus-Erie 29T well drill outfitted with 6-in. nickel-alloy bit and the same gauge is maintained for the entire depth of the hole. Usually the holes are sunk about 4 ft. below the quarry floor although it doesn't seem to make much difference if the distance below the floor is varied one way or another. At the time of our visit the quarry face averaged about 80 ft. in height. These holes are loaded with a Du Pont 60-percent gelatin powder. The company is experimenting with a Du Pont blasting timer in an effort to secure better breakage. Two Lima 1201 diesel shovels with 3-cu. yd. dippers load the shot stone into Euclid 15-ton rear-dump quarry trucks. Stone that is too large for the primary crushers and too small for riprap is broken up with a 6500-lb. Cape Ann drop ball—a method which this company finds very effective. Records to date indicate that about 4 tons of well broken stone are secured for each pound of powder.

The same size hole is drilled for riprap but only two holes are shot at one time, depending upon a good end break to produce the large plus 5-ton stone. It is quite a trick, in the relatively cramped area of this quarry, to keep two distinct operations functioning without one interfering with the other. In riprap blasting the ratio of powder to stone is only 0.2 lb. of powder to one ton of stone. The charge consists of about 15 percent of 60-percent gelatin dynamite, with the balance made up of free running dynamite.

All of the smaller pieces of riprap are handled with a small Owens grapple, but the larger stones are moved with a company-designed basket. It consists of 2 in. steel ring, 12 in. in diameter, to which is tied four pieces of 12-ft. long one-inch cable. Two pieces of ¾-in. chain, each with a grab hook on one end are threaded through eyes fashioned at the free end of each length of cable. The chain is looped around the stone to be moved with the grab hooks fastened into the rear link of the other chain. As the cable is pulled taut, the chain tightens up around the stone, forming a "basket."

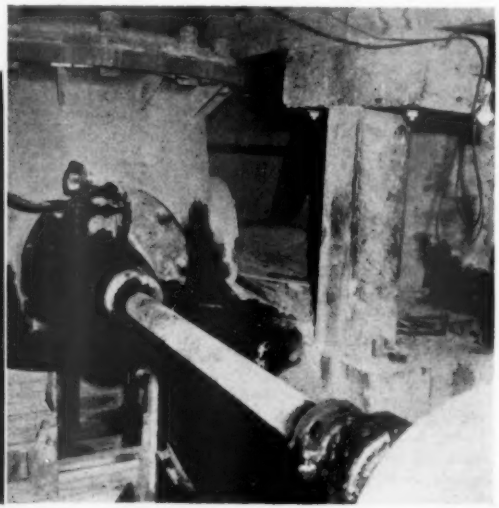
• Two of the four gyratory crushers used for secondary reduction.

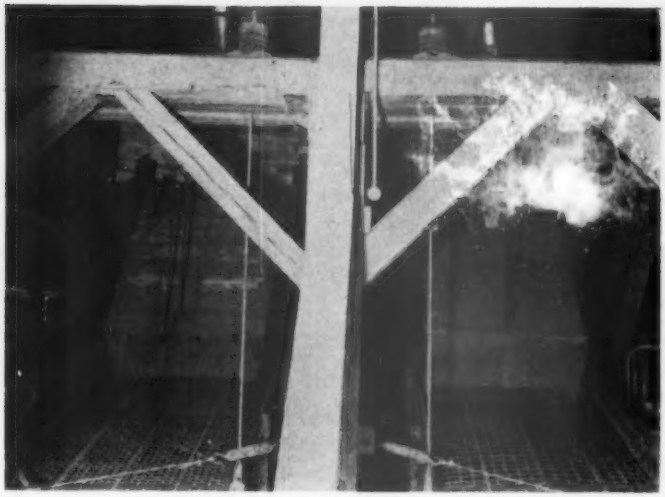
Instead of loading the riprap directly onto flat cars, it is placed into huge steel buckets (see cut) which are in turn placed on the cars. With this system, a railroad crane can handle the stone at either end without special hooks, grapples, or rope baskets.

Crushing and Screening The plant, which was designed by Allis-Chalmers nearly 30 years ago, was laid out so as to

• All bits are dressed on the machine in the illustration below.

• Right: The lower portion of a secondary crusher, showing the pressure method of lubrication.





• All screens are partially hooded at the feed ends, where the dust-laden air is drawn off and sent to the dust collector.

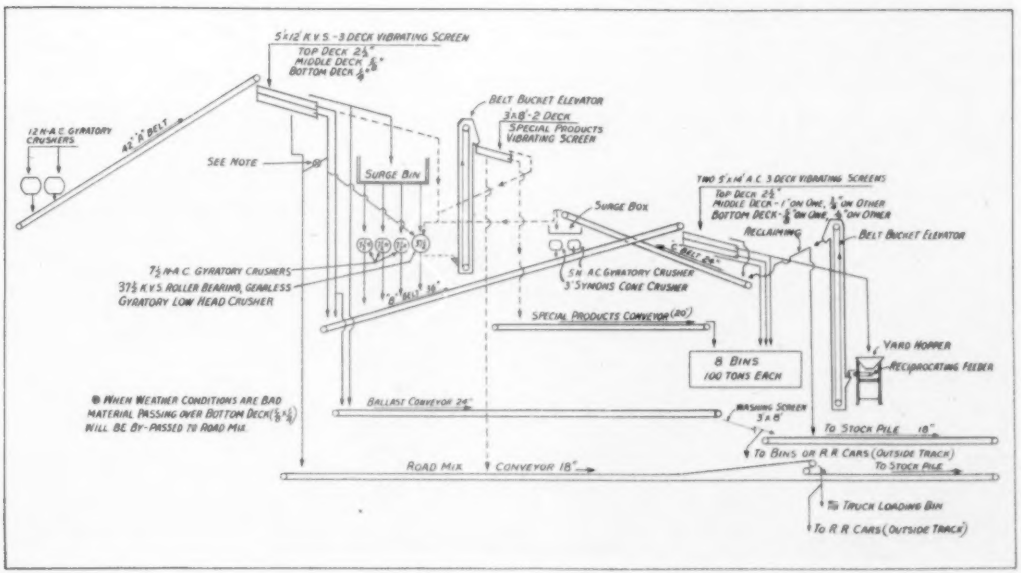
take best advantage of a hilly terrain. The two primaries, Allis-Chalmers No. 12 gyratories, were set side-by-side considerably above the plant and on a level with the quarry floor. Crusher discharge from these primaries is joined on a common 42-in. belt and passed over a Kennedy-Van Saun 3-deck, 5- by 12-ft. screen. This screen, along with the two other vibrating units in the plant, were installed by Zenith as a part of its modernization program to replace three obsolete trommel units.

Plus 2½-in. stone retained on the top deck of the K.V.S. screen is dropped into a large wooden surge bin; plus ⅝-in. off the middle deck is fed onto a 24-in. belt and sent to the ballast stockpile; and plus ¼-in. (and sometimes plus ⅜-in.) from the bottom deck is conveyed to two Allis-Chalmers 3-deck, 5- by 14-ft. screens for further separation. The large stone, plus 2½-in., is recrushed in a battery of four crushers, three A.C. 7½ N. gyratories and a 37½ K.V.S. roller bearing gearless gyratory. Crusher discharge from all four gyratories is joined and conveyed to the A.C. 5- by 14-ft. screen. Further reduction capacity is available by rerouting the oversize off the top deck of this screen back to either one of two secondary crushers—an A.C. 5N. gyratory or a 3-ft. Symons cone. The other sizes of stone off this screen are chuted into one of 8 storage bins, each holding 100 tons of aggregate. For further details regarding the arrangement of crushers and screens and the numerous alternate routes provided in order to insure production of many sizes of stone, see the flow sheet accompanying this report.

This plant has a rated capacity of 300 t.p.h. All of the crushers, screens, and belts are driven with electric motors. The total connected horsepower in the plant is approximately 950.

From March to late October around 60 men are employed at this plant under the supervision of Thor Berg, superintendent. Due to the severe winters in the Duluth area, activity at the plant during the cold period is practically non-existent except for filling small orders from stockpiles. However, a key personnel is retained on a year-round basis, and during the cold months the men are kept busy repairing and rebuilding machinery and improving the plant.

• Flow sheet of the crushed stone operation carried on by Zenith.


5'x12' K.V.S.-3 DECK VIBRATING SCREEN
TOP DECK 2½"
MIDDLE DECK ⅝"
BOTTOM DECK ¼"
BELT BUCKET ELEVATOR
3'x18'-2 DECK
SPECIAL PRODUCTS VIBRATING SCREEN
12 N-A.C. GYRATORY CRUSHERS
42" "K" BELT
SEE NOTE
SURGE BIN
SURGE BOX
TWO 5'x14' A.C. 3 DECK VIBRATING SCREENS
TOP DECK 2½"
MIDDLE DECK-1" ON ONE, ½" ON OTHER
BOTTOM DECK-⅝" ON ONE, ½" ON OTHER
RECLAIMING
BELT BUCKET ELEVATOR
7½ N-A.C. GYRATORY CRUSHERS
37½ K.V.S. ROLLER BEARING, GEARLESS GYRATORY LOW HEAD CRUSHER
5 N A.C. GYRATORY CRUSHER
3' SYMONS CONE CRUSHER
SPECIAL PRODUCTS CONVEYOR (180')
YARD HOPPER
RECIPROCATING FEEDER
8 BINS 100 TONS EACH
WHEN WEATHER CONDITIONS ARE BAD MATERIAL PASSING OVER BOTTOM DECK (⅝"x¼") WILL BE BY-PASSED TO ROAD MIX.
BALLAST CONVEYOR 24"
WASHING SCREEN 3'x8'
TO STOCK PILE 18"
TO BINS OR R.R. CARS (OUTSIDE TRACK)
TO STOCK PILE
ROAD MIX
CONVEYOR 18"
TO TRUCK LOADING BIN
TO R.R. CARS (OUTSIDE TRACK)

Stone Plant Processes Coal Pit Overburden

To get a seam of coal, a layer of limestone had to be removed. Instead of wasting this rock, the company installed a simple but effective crushing and screening plant.

another ON THE SPOT report

By EDWARD BRUNENKANT

WHEN the Badgett Mine Stripping Corp. first began stripping operations on the West Kentucky Coal Company's property near Earlington, Ky., their contract guaranteed the removal of 20,000 tons of coal a month. Today it is a poor month if less than 100,000 tons of coal are stripped and sent to the nearby coal washing preparation plant. For a clearer perspective of the size of this operation it is necessary to view the physical characteristics of this deposit. The first coal shelf, a No. 12 grade averaging 4 ft. in depth, is covered with 50 ft. of overburden. Separating the first seam of coal and a second lower shelf, a No. 11 grade about 6 ft. thick, is a 6-ft. bed of limestone.

For the first few years of operation, the limestone excavated in order to reach the second layer of coal was discarded as a waste product. The considerable tonnages of rock involved made disposal of it something of a headache. When the State of Kentucky jumped its gasoline tax 2 cents a gallon with the added provision that a large share of the funds would be redistributed to the counties for county roads, the management of Badgett Mine Stripping Corp. decided it was time to do something besides waste its stone. The fact that the nearest commercial stone quarry was located more than 40 miles away lent additional weight to the decision to build a crushed stone plant. As the company was primarily interested in the stripping of coal, the managers felt that the mechanics of the crushed stone operation should be as simple and uncomplicated as modern crushing techniques would permit. In other words they wanted a one-crusher setup, big enough to handle the tonnages available yet flexible enough to produce saleable sizes of crushed stone. For this purpose a new Holland 5050 double impeller breaker was selected.

With the breaker bars spaced at approximately 4-in. intervals, this New Holland unit will take a 4-ft.-square rock and reduce it to minus 3½ in. One of the chief problems is to divert enough trucks from the stripping activity to keep the crusher operating at peak capacity. Despite this difficulty, the plant has consistently turned out in excess of 2000 tons of rock in one 8-hour shift.

• Russell Badgett, Jr., a member of the Badgett Mine Stripping Corporation's personnel.

The stone is hauled from the stripping site in 15-cu. yd. rear-dump Euclids which discharge into a steel hopper positioned over a Pioneer apron feeder. To stop any stone from being hurled out of the feed end of the breaker, due to the terrific action of the massive impellers, the feed-opening is curtained with 4-in. drag line chains. Each impeller is driven through V-belts by a 125-hp. electric motor.

The crusher discharge is carried on a 42-in. by 50-ft. belt over an Allis-Chalmers 6- by 14-ft. 3-deck vibrating screen. Material sized on this screen, 2½-in. from the top deck, 1½-in. from the middle, and ½-in. from the bottom, is chuted into Johnson 3-compartment steel bin with an overall storage capacity of

• A general view of the Hopkins County Limestone plant operated by the Badgett concern near Earlington, Ky. This plant was built to utilize limestone stripped along with the coal.

• Looking toward the feed end of the double impeller breaker, one sees the feed opening curtained with 4-in. dragline chains to stop any rocks which might be thrown out by the terrific action of the massive impellers.

• This new walking dragline is equipped with a 165-ft. boom and a 13½-cu. yd. bucket.

100 cu. yds. Oversize rejected off the top deck is returned to the breaker on a 24-in. by 50-ft. conveyor belt traveling at 40 f.p.m. The speed of the 42-in. main conveyor belt is in the neighborhood of 500 f.p.m. Even at this speed the belt is frequently overloaded carrying, at times, a load of stone more than 6 in. deep. To remedy this condition the size of the motor driving the belt has been increased 10 to 15 hp.

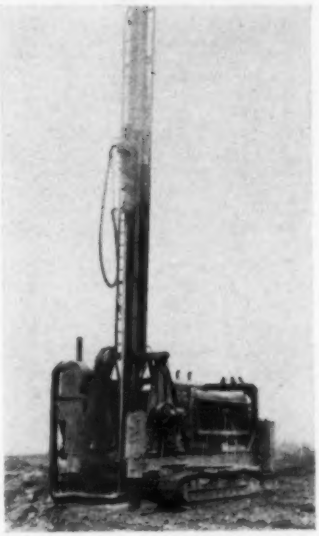
The property that ultimately will be stripped to supply coal for this West Kentucky processing plant amounts to about 300 acres. A Bucyrus-Erie 450-W dragline equipped with a 165 ft. boom and a 13-cu. yd. bucket removes the overburden in 80-ft.-wide pits. In order that this massive piece of machinery can be moved more easily, a small "Caterpillar" dozer continuously works behind the dragline, clearing and leveling a road for the next shift position.

A large share of the deep drilling is done with an Ingersoll Rand "Quarrymaster". Shallow holes are sunk with two Cleveland wagon drills mounted on a D8 "Caterpillar" tractor. This arrangement provides a highly mobile twin drilling rig. Air for drilling is supplied with a Sullivan 550 c.f.m. compressor also attached to the "Cat".

The coal, as well as the stone, is loaded with a Bucyrus-Erie 120B electric 5½-cu. yd. shovel. In order to increase the overcasting range of this machine the boom was lengthened 13 ft. and the sticks 10 ft. An additional 15 tons of counterweight had to be added to the rear of the machine to keep the unit in proper balance.

Before coming to Kentucky for

(*Continued on page 76*)



• All of the deep blast holes are sunk with this large but highly mobile drilling rig.

• A slick mobile drilling rig. Two wagon drills are mounted on this tractor.

• Below, right: One of the shovels loading coal. The deposit occurs as follows: 50 ft. of overburden, 4 ft. of coal, 6 ft. of limestone, and 6 ft. of coal. Before this crushing plant had been installed, the stone was wasted.

Canadian Lime Output For 1948 Analyzed In Government Bulletin

The Lime Industry in Canada, 1948, a publication of the Dominion Bureau of Statistics, reveals that production of lime last year reached a new high of 1,053,584 tons, valued at $10,655,062. These figures represent an increase of 7.8 percent in tonnage and 24.7 percent in value over corresponding 1947 totals—977,413 tons and $8,542,507, respectively.

Of the 850,043 tons of quicklime produced, 785,082 tons were used for chemical and industrial purposes and 64,961 tons for other uses. Hydrated lime used in chemical and industrial plants amounted to 96,756 tons, and the building and agricultural trades purchased 106,785 tons.

Stone utilized in the manufacture of lime in Canada includes calcium, high calcium and dolomitic varieties of limestone. It is estimated that 1,792,700 tons of limestone were burned for production of lime in 1948. In addition, a considerable tonnage of lime was recovered as a byproduct from chemical plants.

In the 42 active Canadian plants, 1,121 persons are employed. Wages and salaries for these plants amounted to $2,459,299. Fuel and electricity cost $3,117,667, and expenses for process supplies, including containers, totaled $672,566.

Canada exported 32,354 tons of lime in 1948, valued at $471,109; imports totaled 23,878 tons worth $219,485.

Metz Aggregate Co. Plant Slated for Early Production

Preliminary trial operations at the Metz Aggregate Company's plant at Metz, Calif., were held recently, and the sand-and-gravel processing is expected to be in full production in the immediate future.

According to John Porter, head of the concern, output will be two carloads per hour when the plant is running at full blast. Both rail and truck facilities have been provided. It is estimated that the gravel deposit contains virtually unlimited quantities, running into millions of tons.

"Largest" Perlite Deposit Is Discovered in New Mexico

The recent discovery of a perlite deposit in the northern part of Taos County in New Mexico, said to be the largest in this country, will give employment to 250 men in open-pit mining operations. This prediction was made by Gus Jenkins, Antonito, Colo., who discovered the deposit.

Mr. Jenkins has a claim on 2000 acres near San Antonio Peak. He stated that two carloads of the perlite from a tract adjoining his holdings and shipped to Torrance, Calif., by the Great Lakes Carbon Company, tested as high-grade material. He described the deposit as a cliff about 150 ft. high and a half mile long. The comparatively thin overburden will make mining operations simple.

Washington News Letter

(*From page* 64)

tributed. From 1940 to 1944, the most active wartime years, income payments to individuals increased by 100 percent, that is, doubled. From 1944 to 1948 the post-war years they increased a further 34 percent.

During the war it was the Far West which got the major advantage, an increase of 149 percent. The increase in 1944 was almost 2½ times as high as in 1940. Next higher were increases in the Southeast and Southwest. These increases resulted principally from the location of new industries and military installations in those areas. The old industrialized areas were less fortunate.

After the war, however, the pattern changed substantially. From the standpoint of increased income, the Far West is no longer the most rapidly expanding region. As a matter of fact, it has expanded least rapidly. Expansion is also slow in New England. This fact reflects the especially unfortunate position in which New England finds itself. It didn't expand as much as the rest of the country during the war and it hasn't expanded as much as the rest of the country since the war. Truly, it is falling far behind and rapidly becoming one of our most serious problem areas.

In the post-war period, the industrialized areas have been expanding more than most of the country but not as rapidly as the Northwest. That area has become very prosperous through producing grain to meet the world's food shortage.

Appalachian Minerals

(*From page* 67)

Grinding Plant The present feldspar grinding plant was built late in 1947 at a cost of approximately $100,000. At the present time grinding facilities are limited to the preparation of 20-mesh feldspar for glass manufacturers. Currently, Appalachian Minerals is adding equipment for making the 200-mesh grain-size feldspar.

The washed feldspar is drawn off from the storage bins into oversized wheelbarrows which are dumped into a Diamond 5-ft. by 90-in. feeder preceding a 15- by 24-in. jaw crusher of the same make. Since the feed for this plant comes from four different mines (no one deposit will give a consistently uniform analysis by itself), the use of wheelbarrows at this stage of the processing cycle provides a practical method for blending the mined feldspar to correct proportions. This blending is important, since each 2 percent of free SiO_2 would lower the Al_2O_3 content by 0.5 percent. In addition, it is highly desirable to keep the potash (K_2O) content relatively uniform, since this constituent is of particular value to manufacturers of the better grades of pottery and of high-tension insulators.

The crusher discharge, minus 1½-in., is fed into an oil-fired rotary dryer where the moisture in the stone is reduced to less than 0.5 percent with temperatures ranging around 500 deg. F. Dryer dust is exhausted and collected in a company-designed 4-ft. cyclone and returned to the circuit. Both the dust and regular dried stone are passed over a completely enclosed 2-deck Tyler Hum-mer 4- by 10-ft. screen. The top deck is covered with a 4-mesh cloth that protects the 20-mesh screen cloth covering the second deck. Plus-20-mesh feldspar is chuted into a CF5-32 Pennsylvania Impactor operating in closed circuit with this screen while the minus-20-mesh material is passed over a Tyler 3- by 10-ft. splitter screen fitted with a 40-mesh cloth. After splitting the screen feed into two grain sizes, plus-40- and minus-40-mesh, the two sized products are stored in two 5-ton surge bins preceding a Dings 30-in. roll magnetic separator. This unit is a three-roll type in which the magnetic waste product is drawn off from two sides. Less than 2 percent of all the material passed through this separator is discarded as waste because of undesirable iron impurities.

The feldspar is stored in three concrete silos (12-ft. inside diameters) each having a live storage capacity of 140 tons. All are equipped with chutes for loading both hopper and box cars. An additional provision included in the silo design permits the feldspar to be drawn off from the bottom for feeding the fine grinding plant now under construction.

The high-grade, potash feldspar produced at Monticello by Appalachian Minerals brings around $11 per ton for the 20-mesh product. When the company swings into production of the 200-mesh feldspar, it will sell for more, probably $16 to $18 per ton. The plant is about 40 miles north of Macon and is served by the Macon-Athens branch of the Central of Georgia Railroad.

After Twenty Years— Fort Worth Plant Operates Efficiently With Most of the Original Equipment

By WILLIAM M. AVERY

another ON THE SPOT report

WHEN the Quigley plant of Fort Worth Sand & Gravel Company went into operation just 20 years ago, it was the subject of great interest throughout the industry. Although in its basic design the plant was not unlike others built prior to 1929, a number of special features were incorporated which made it unique in its field.

Some months ago we were reminded that Quigley was completing its twentieth year of successful, economical operation, and it was pointed out to us that the original flow sheet and most of the original equipment were performing as satisfactorily today as when the plant first went into production. We might have guessed this, for Fort Worth Sand & Gravel has a well-deserved reputation for being one of the most progressive operating concerns in the industry, and its yardstick of what constitutes satisfactory plant performance would be more rigid than most. We concluded, at any rate, that back of the bare facts there must be a story, and a visit to the plant was accordingly arranged.

Although in a few spots, most notably around the washer, the Quigley plant does show some of the ravages of time, there is little to indicate that it has been in almost continuous service for a fifth of a century. Photographs taken from the same vantage points in 1929 and in the current year show no fundamental differences. The only important changes which have been made were necessitated by the gradual shift from rail to truck shipments.

The plant is located 8½ miles east of Fort Worth, in the valley of the Trinity River, near a station on the Rock Island railroad known as Hart Spur. It was built as a railroad plant, and cars were loaded from a tipple which straddled the spur track into the property. For a time all shipments were made by rail, but soon there was a demand for truck shipments, and two bins were built on one side of the original tipple. As rail freight rates increased, economical truck hauling distance went up, and this, in combination with steadily improved road conditions in the area, resulted in a gradual shift from rail to truck loading. Before long it was necessary to build three additional truck loading bins on the opposite side of the tipple. Today 90 percent of Quigley's production is shipped by truck.

• A recent view of the battery of vibrating screens at the Fort Worth plant of the Fort Worth Sand and Gravel Company. See the bottom of the page for a view of this plant taken shortly after it was placed in operation 20 years ago.

• Only the obvious antiquity of the truck in the foreground dates this 20-year-old picture of the plant. The original screens and most of the scrubbing and sand recovery equipment still give efficient service.

The six Leahy No-Blind vibrating screens (manufactured by the Deister Concentrator Co.) which were installed in 1929 are still in service today. They are all 4- by 7-ft. units of the single-surface open type, and each is driven by its own individual electric motor. They are supported on structural steel frameworks at a height of nearly 60 ft. above ground level.

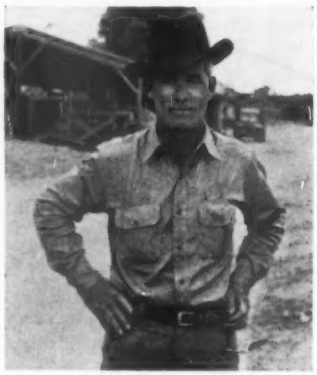
The height of the screens, in combination with the relative lightness

of the steel framing, caused the designers some concern on the score of how much vibration would be imparted to the structure. One of the features of the Leahy screen is that only the screen cloth vibrates, and it was the manufacturer's contention that for this reason no appreciable vibration could be transferred to the supporting structure. This proved to be the case, for there has been no noticeable vibration in the structure since the day it went into operation.

There have been no changes in the flow sheet. Since there is little gravel in the deposit exceeding 2½ in. (the largest size prepared at Quigley), there are no crushing facilities. Pit run material is dumped into a hopper and conveyed to the top of the washing plant, where it is sluiced into a 60-in. Telsmith revolving scrubber. The sand passes with the water into sand boxes and is further washed and dewatered by means of two ordinary sand drags; it is then elevated on a 24-in. Telsmith belt conveyor and discharged onto a storage pile. The plus ⅛-in. material is conveyed beyond the sand discharge point to the hopper of the first (or 2½-in.) Leahy screen. In similar stages the other vibrating screens successively prepare oversizes of 1½-in., ¾-in., ½-in., and ¼-in.

Although relatively common practice now, the extensive use in the Quigley plant of tunnel conveyors for recovery and blending was something of an eye-opener when the plant was built. The main materials-handling tunnel runs under the seven storage piles. It is fed by lateral tunnels extending in both directions under each of the storage piles. The main conveyor slopes upward toward the discharge end and deposits its burden on a cross conveyor which feeds the loading-out section of the plant. With this arrangement of recovery tunnels, any desired grade of aggregate can be fed to the loading bins, and variations in grade may be accomplished at any time.

• Built as a railroad plant, Quigley now ships 90 percent of its production by rail. Additional truck bins have been built on both sides of the original loading tipple.



• W. R. Thomas, general superintendent.

• A recent addition to the facilities of the Quigley plant is this 6-compartment weigh batcher for ready-mixed concrete operations.

Today, as when it first went into operation, the plant is producing at the rate of 225 t.p.h. Although excess motor capacity was provided for future increases in output, and provisions were made in the design to double the number of screens, it has never seemed necessary or desirable to expand the capacity of the plant.

Soundly engineered and well-equipped in the beginning, the Quigley plant as it stands today is unquestionably good for many more years of efficient, trouble-free production. It has been, and will surely continue to be, an important factor in the growth of the city of Fort Worth. Its service to the rapidly developing area east of the city was expanded recently by the installation of a 6-compartment Blaw-Knox weigh batcher for use in ready-mixed-concrete operations. The batching bins are fed by belt conveyor from the loading section of the plant.

T. E. Popplewell is president and treasurer of Fort Worth Sand & Gravel, and is also currently president of the National Sand & Gravel Association. The company's vice-president is J. J. Randol, and L. W. Dunn is secretary. W. R. Thomas is general superintendent of the Quigley plant.

Stone Plant Erected

(*From page* 73)

this coal-stripping operation the Badgett organization was engaged in construction of levees around Memphis, Tenn. Top personnel in the organization include three Badgetts—Russell Jr., Rogers and Brown. The crushed stone plant is operated under the name of the Hopkins County Limestone Co.

Marquette Denied Motion For Dismissal of U.S. Suit

At Denver, Colo., a motion by the Marquette Cement Manufacturing Company for the dismissal of a government anti-trust suit was denied by Federal District Judge J. Foster Symes.

Marquette is one of 80 cement firms named in a suit filed in the Denver federal court in 1945, alleging violation of the Sherman anti-trust act. A similar motion by 57 of the concerns was denied at Denver on July 20.

Dolomite- and Magnesium-Containing Agstone—Part II

By W. D. KELLER
Professor of Geology
University of Missouri

Mineral and Chemical Compositions of Limestones

THE mineral names, calcite and dolomite, which have been used in Part I should be explained for those who are not mineralogists.

Calcite is the solid, pure mineral which has the chemical composition calcium carbonate, $CaCO_3$. Obviously it is the mineral of high calcium limestone, for that is the only essential mineral present in high calcium stone. Dolomite is a name used interchangeably for both the pure mineral, and the bulk rock which is made up dominantly of dolomite mineral. Dolomite mineral is a single molecule of calcium magnesium carbonate, $CaMg(CO_3)_2$. It is *not* a mechanical mixture of half calcium and half magnesium carbonate, but is a composite chemical molecule in which the calcium and magnesium are combined, interlocked, or inter-bonded into a double-jointed single molecule. The calcium and the magnesium cannot be separated by any simple mechanical means. They must be broken apart chemically and when one is released from the compound at the same time so is the other released. Evidence for the difficulty of separation of magnesium from calcium in dolomite mineral lies in the complex chemical process which must be utilized in the extraction of magnesium metal from a dolomite source. If a simple separation were possible, then the light-weight magnesium metal which was used extensively during the last war could be produced much more cheaply than is now possible and more dolomite would be quarried and sold. Mother Nature has decreed that when dolomite is used as an agstone, both calcium and magnesium will be freed within the soil system.

If a rock in the quarry, or in a prospect, has been identified as being dolomite, or a mixture of dolomite and calcite, a chemical analysis is usually necessary to determine the exact amount of magnesium and calcium present. If only calcite, (calcium carbonate had been present a calcium carbonate equivalent analysis would suffice. A calcium carbonate equivalent determination is more complicated on a dolomite because a pure dolomite will test more than 100 percent $CaCO_3$ equivalent.

Meaning of Calcium Carbonate Equivalent Analysis

Limestone producers frequently ask just what is the meaning of the calcium carbonate equivalent test and how is it possible for any limestone to test more than 100 percent? This is a very sensible question because we know that 100 percent represents absolute purity and therefore, unless we define a special meaning for the term, an excess of over 100 percent is impossible. After one understands the elementary chemistry involved in the way that the chemist makes his analysis, it is simple to understand the logic of more than 100 percent calcium carbonate equivalent. We will go over the reason in considerable detail.

The original calcium carbonate equivalent test was set up on the basis that a high calcium limestone which was absolutely free from any impurities of sand, clay, iron oxide or other minerals, would react with acid and neutralize 100 percent of a quantity of acid which was chemically equivalent to the weight of the limestone taken for an analysis. That pure stone had an equivalent of 100 percent. If, however, the high calcium limestone contained 3 percent clay, 2 percent quartz sand, and 1 percent brown iron oxide, then the limestone would react with only 94 percent of an equivalent amount of acid (because the 6 percent of clay, quartz sand, and iron oxide impurities do not react with the acid and the limestone would test and be recorded 94 percent calcium carbonate equivalent.

Chemists have found by experiments (and by theoretical computation before the experiments were performed) that an equal weight of dolomite will react with approximately 8 percent more acid than will an equal weight of high calcium calcite limestone. The chemical reason for this is absolutely sound. The individual *atoms* of calcium and magnesium differ in weight and therefore when the chemist takes for example 1/25 of an ounce of pure calcite rock and then 1/25 of an ounce of pure dolomite rock for analysis, he is handling different numbers of atoms in the two samples even though their bulk or rock weight is the same.

Hence, to make the chemical story short and to arrive immediately at the answer, the chemists find that *equal* weights of calcite and dolomite rocks on a pure basis will neutralize respectively 100 parts or percent for the calcite, and close to 108 parts or 108 percent for the dolomite, of standard equivalent acid. Therefore, so long as the chemist continues to use the calcium carbonate equivalent as a measuring stick, the pure dolomite will test more equivalence than an equal weight of pure calcium carbonate.

If sand or clay impurities were never present in agricultural stone, it would be very simple to calculate the amount of magnesium in an agstone from the excess of calcium carbonate equivalent over 100 percent. From a practical standpoint because impurities are present in almost every agstone, the chemist and quarry operator must know what percentage of insoluble impurities are present in the agstone if they wish to translate calcium carbonate equivalent of dolomite agstone into calcium and magnesium composition. This translation may become a little bit complicated for the practical quarry operator unless he has had some practice in working with chemical compositions. Ordinarily he will want to leave it up to his chemist to furnish him with a finished analysis which will tell him the composition of his agstone. The purpose of this discussion was to explain why a dolomite limestone may run higher than 100 percent in calcium carbonate equivalent, but the other details have been added to indicate some of the complications that may arise when rock impurities have to be contended with.

Dolomite in Ore Veins

Dolomite does not always occur in the common horizontally-bedded deposits, but may occur also in association with more or less vertical ore veins. Under those circumstances the dolomite is usually thrown aside as waste or so-called "gangue" rock. Here may be a potentially valuable source of magnesium for magnesium deficient soils in a region where limestone does not crop out at the surface. It may also be an important source of magnesium within an area of high calcium limestone.

Magnesite and Other Magnesium Minerals

Magnesite, $MgCO_3$, is a rich source of magnesium, but has been produced commercially in large quantities in only Washington, Texas, California and Nevada. Other deposits of smaller size, but still pure and large enough to be utilized as agstone are potentially available in other parts of the United States, but the geological conditions are not favorable over most of the United States for the occurrence of magnified deposits. Therefore, their number and occurrences are expected to be severely restricted.

Certain magnesium-rich silicate minerals, like varieties of olivine and pyroxene, may be utilized in the future where economical conditions warrant their use as a source of magnesium agstone. Some magnesium-rich furnace slags are a possible source of magnesium agstone.

Minerals which are a natural combination of magnesium, potassium, sulphate, and other chemical elements occur in relatively restricted deposits deeply buried beneath the surface of western Texas and eastern New Mexico. These rocks and minerals have been used as soil supplements to supply both potassium and magnesium and are competitive to dolomite. Still other rocks and minerals will be recognized as possible sources of magnesium by geologists and mineralogists but a detailed list of these substances is beyond the scope of this paper.

Epsom salts is a chemical compound of magnesium which will supply that element immediately because it is highly soluble in water. The high cost of epsom salts and relatively small amount of elemental magnesium do not recommend the chemical for their extensive use as agstone.

Magnesium Content of Various Raw Materials

Chemical analyses of dolomite and other magnesium minerals may be reported in a chemical analysis in a variety of ways: as calcium oxide, magnesium oxide, and cabron dioxide, or as calcium carbonate and magnesium carbonate. The potentialities of various raw materials in furnishing the element magnesium to soil colloids and then to plants may be compared by expressing their composition in terms of magnesium as an element. Several magnesium compounds are listed below in terms of their elemental magnesium content which is approximately figured on a basis of the pure theoretical compounds.

Dolomite	$CaMg(CO_3)_2$	13% Mg 22% Ca
Magnesite	$MgCO_3$	29% Mg
Epsom salts	$MgSO_4.7H_2O$	9.8% Mg
Periclase	MgO	60% Mg
Polyhalite	Mg,K, SO_4, etc	4% Mg
Calcite	$CaCO_3$	40% Ca

Dolomite Reaction with Soil Constituents

As a general case, dolomite is not quite as reactive toward acid as is high calcium stone. This statement has been demonstrated by the hydrochloric acid differentiation test which was described above. We may expect the same characteristic to carry through in part in reaction with acid soils, but the difference between calcite and dolomite limestone will not be so marked in soil reaction because there is no limit on the time to which the pulverized limestone or dolomite will be exposed and in contact with acid clays or humus in soil. To compensate for the slower reactivity of dolomite some operators have recommended that dolomitic agstone be pulverized slightly finer than high calcium stone. However, more practical tests under carefully controlled conditions should be run in order to give us reliable quantitative data on a comparison of the two agstones. Dolomite which has been crushed to meet specifications of regular agricultural limestone has worked satisfactorily in practice.

A soil condition which bears on the use of dolomite after excessive liming by high calcium stone was recently described to the writer. This particular soil plot had been treated by high calcium lime in such a large quantity and with repeated applications so that all of the natural soil acidity had been neutralized. A chemical test of the soil showed a deficiency in magnesium, and attempts to grow a crop on the soil failed because there was not enough magnesium available to produce a normal healthy crop of plants. When dolomite was added to this completely-neutralized soil the dolomite was not very effective. The reason of course is that the reactivity of the soil had been completely taken up by the high calcium limestone which was present in excess of soil acidity, and therefore no acidity was left in the soil to react with dolomite and mobilize magnesium for plant availability. An application of highly soluble epsom salts restored crop production. Probably finely-pulverized dolomite applied with the seed would have worked also.

It has been found that when the ratio of calcium to magnesium exceeds a certain value, which varies somewhat with different soils or plants, then crop growth is impaired. It is important that magnesium reserves in the soil should never be permitted to descend to too low a level. Magnesium-containing agstone should be added before liming with high calcium stone has gone to excess. The details of these relationships belong in soil science and agronomy, and will vary somewhat with different localities, hence will not be discussed further here.

Agstone, a Supplier of Plant Nutrients

Prior to the use of agricultural limestone there were three traditional fertilizer substances, namely nitrogen, phosphate and potash, the N-P-K trio. For a time they were considered *the* fertilizers, a sort of royalty group, whereas limestone was relegated to the inferior position of a substance which was added simply to neutralize acidity. This notion was erroneous, as is now quite evident. The reason that nitrogen, phosphate and potash were added earlier in the fertilizing scheme is that they were the first nutrients to be removed from soils by cropping to a recognizable deficient level. They had to be added if plants were to be grown. The reserve of calcium in soil was notably greater than that of nitrogen, phosphate and potash, but as continued cropping was stimulated by the addition of the N-P-K, calcium was the next element to become deficient.

Soil acidity commonly accompanied the removal of calcium and in an effort to correct acidity fortunately an agstone that contained calcium was applied (limestone). It is now recognized that the correction of such to the soil is not to remove acidity, but rather to add calcium to replenish that which has been taken out by stimulated cropping.

The magnesium reserve of most soil has been relatively greater than that of calcium. However, the prolonged cropping of many soils, despite their originally high reserve of magnesium, has lowered it to the deficient status earlier recognized for N-P-K and later for calcium. Likewise a deficiency level of the micro-nutrients or so-called "trace elements" has also been reached in many soils.

To restore the fertility of many soils to a high level of efficient production calcium, magnesium, and the trace elements must be added as

(*Continued on page* 81)

Spark Plugs For Internal Combustion Engines*

Part III

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SPARK PLUG LOCATION

The location of the spark plug in the combustion chamber has a great effect upon the performance of the engine. As the location is fixed in existing engines it is of no concern to the average user; to the engine designer, however, it is of considerable importance.

For high-power performance a short but controlled burning time for the fuel is necessary, requiring a short flame travel. This can be accomplished by placing the plug as near as possible in the center of a combustion chamber which approaches a sphere in shape. This condition is reasonably satisfied in the hemispherical aircraft cylinder head where, by using two plugs, two flame sources are initiated which burn toward each other.

For good idling and high speed performance, a plug location near the intake valve is preferred, a location where there is a good combustible mixture regardless of stratification or dillution with burnt gases from the previous charge.

To minimize detonation, a plug location near the exhaust valve is advisable, which is usually the hottest region. This site is selected so that the flame front can advance into the cooler region of the combustion chamber. The pressure and temperature of the unburned charge increases during combustion, but the temperature increase would be considerably greater if compressed against a hot exhaust valve than against a cooler surface and, in the former case, detonation may result. To accommodate all these conditions, a compromise position between the intake and exhaust valves is frequently selected.

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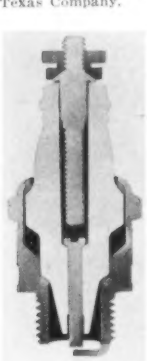


Left: Fig. 13A. An outboard motor spark-plug. Right: Fig. 13B. Model airplane plug.

GAS LEAKAGE

Under most types of operation modern plugs are very tight as far as internal gas leakage is concerned. Plug designs that can be disassembled may show leakage after overhaul if the sealing gasket was defective or not properly seated. A cracked insulator also may show leakage as will a plug with a defective seal between the center electrode and the ceramic or between the ceramic and steel shell. The effect of nominal leakage is negligible insofar as loss of compression pressure is concerned, but is of great importance in that it can alter the operating characteristics of the plug itself. Leakage carries hot gases, fuel soot, combustion residue, etc., up through the plug body and makes it operate hotter than designed. Fuel soot and deposits in the leakage path within the body may cause misfiring by forming a conductive track to ground.

Gas leakage in some plugs is revealed by a vertical, streaky sooting of the external, glazed insulator. When the insulator is generally dirty, however, care must be taken not to mistake a clean ring on the insulator just above the shell crimp to indicate gas leakage because the high dielectric strength of certain ceramics can cause a corona discharge to char the dirt from that area. Leakage can be determined by a standard spark plug tester or by screwing the plug into an adapter, immersing in water or kerosene, and applying air pressure. Bubbles immediately indicate a leak. Testing techniques for aircraft plugs may use pressures up to 800 pounds per square inch.

Fig. 13C. Detail of a model airplane plug, a "glow plug," showing the firing end.

SMALL TWO-CYCLE ENGINES

Small two-cycle gasoline engines, such as outboard marine engines, those used to power lawn mowers and small generators, as well as model airplane engines have a characteristic type of operation which requires special spark plug treatment. As these engines are lubricated by mixing the oil with the gasoline, a large proportion of oil finds its way into the combustion chamber and onto the plug. This necessitates careful selection of lubricant and fuel to minimize combustion chamber deposits for, without that selection, the best of spark plugs will not perform satisfactorily. Highly refined oils with low carbon-forming tendencies are preferred. Certain residual oils and some additive-type oils generally leave more ash and deposit or carbon than distillate mineral oils or blends of distallate and well-refined residual-type oils. Some additive oils, however, do make cleaner-running engines. Therefore no blanket statement can be made on the effect of base stocks or additives; too much depends upon the specific components. White gasoline (unleaded) usually would be preferred for cleanest operation, but there are times, when the load conditions and temperature are such that leaded gasoline runs with less over-all deposits.[1]

When purchase of the necessary stocks must be made at the nearest service station, there are times when proper selection cannot be made; the best fuel and lubricant for automotive service may not necessarily be the best for two-cycle operation. The fuel is likely to contain appreciable amounts of tetraethyl lead, with one or more ash-forming additives in the lubricant. In this case, depending upon the type of service —light or heavy duty—different characteristic failure patterns may be expected for an extended operation. Light running, especially at time of starting, may lead to oil coking, causing plugs to misfire. Burning of the oil-laden fuel will create large amounts of soot. To accommodate this excessive sooting

[1]The mechanism by which leaded-fuel combustion alleviates carbon deposits in two-cycle engines is not well understood. Some believe it due to a chemical interaction between the two; others hold that the impact of the lead compounds against the combustion chamber walls knocks off the carbon.

tendency, a plug operating hot enough to oxidize the carbon is required with a lean carburetor adjustment. When properly selected, a dry, clean plug, chocolate brown in appearance, can be expected.

Figure 13 (A) illustrates a typical outboard motor plug which has a long heat-flow path from the electrodes to the water jacket while, at the same time, its overall height is kept down for it to fit in the low overhead clearance space under the spray hood of the engine.

The model airplane engine, another two-cyle application, using mixtures as rich as one part heavy motor oil to three parts gasoline may run much hotter and heavier than its diminutive size suggests. In terms of IMEP or horsepower per cubic inch displacement some of these model engines may really be in the high output category, and relatively cold plugs can be tolerated.

Figure 13 (B) shows the smallest, commercially made model airplane plug, having a thread size of ¼″ x 32. Note the needle-like treatment of the ground electrode. The sharp point reduces the voltage required to produce a spark and makes easier firing on the sub-standard ignition systems.

Another variation in model airplane performance depends upon a sparkless self-ignition from an incandescent source, somewhat related to the uncontrolled effect pre-ignition, which all other engine designs try to avoid for stable operation. As previously mentioned, if a region exists in a combustion chamber at a sufficiently high temperature, ignition of the fuel will take place without the necessity of an electric spark. These small engines maintain a hot spot by the use of a "glow plug," the firing end of which is shown in Figure 13 (C), which is essentially a fine wire coil, frequently a platinum alloy, sufficiently thermally insulated that it will remain incandescent by virtue of the combustion surrounding it. To start the engine, a dry cell is connected to the plug until the coil becomes heated (as if it were a lamp filament). The current is continued until the engine runs.

For high load, steady running service such as driving farm equipment, pumps, generators, etc., for sustained periods sooting is relatively unimportant. Plugs, though, may encounter electrode erosion, and shorting out caused by a whisker-like deposit build-up bridging the electrodes. Accumulations of electro-conductive deposits on the electrodes can reduce the effective gap length and, due to the inherent construction of many flywheel-type magneos, especially those in outboard marine engines, decreasing the plug gap length can over-advance the spark by as much as 50 percent, creating a situation akin to pre-ignition which may result in complete engine failure.

This unwanted early spark is believed due to the condition where, with a nearly-closed spark gap, the residual electrical energy in the system is sufficient to produce an additional spark at the plug gap when the interrupter closes, i.e., "makes," rather than when it "breaks" at the designated timing point.

Tendencies towards electrode bridging can be counter-acted to some extent by using a plug in which the end of the side electrode comes only to the center line of the center electrode [as shown in Figure 13 (A)], rather than totally covering it as is commonly done in automotive practice. With the off-set electrode, there is less masking of the spark by the electrode and less electrode surface is exposed for deposit accumulation. Furthermore, there is more opportunity for turbulence in the combustion chamber to keep the gap clean.

OIL ENGINES

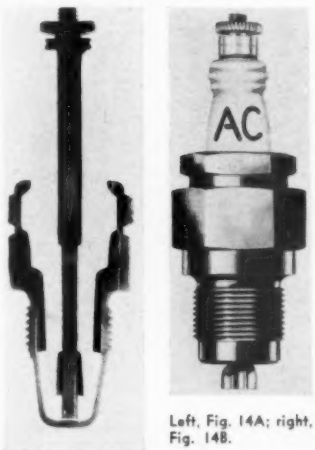
Spark plugs are used in certain types of small size, high-speed diesel engines to provide easy starting, especially in cold weather when the cranking effort is very severe on storage batteries. Such engines are so constructed that they can be temporarily converted from a normal, high compression, Diesel engine into a gasoline engine with carburetor, spark ignition and low compression. As the carburetor, manifold and ignition systems are designed specifically for starting only, this type of engine usually starts more easily than a regular gasoline engine of comparable size where power and economy are of major importance. Once running, the engine can be switched over to full Diesel operation; the "gasoline part" of the combustion chamber (containing the spark plug) is sealed off by a poppet valve.

Oil engines of the Hesselman type require a spark for controlled ignition. Such engines are frequently found in farm tractors, contractor's machinery and road patrol services where steady, high loads for long intervals are common. Tractor fuel or diesel fuel is injected directly into the cylinder (same as for diesel operation) where, from heat compression, it partially vaporizes. Combustion is initiated by the spark plug, usually at 10—12 deg. before top dead center. To provide easier starting, gasoline is frequently injected into the intake manifold from a hand primer.

As a portion of the spray from the injected oil inadvertently wets the electrodes a special, hot-running, spark plug design is required, otherwise extreme sooting would result. Some styles are two-piece construction with a glazed insulator to facilitate "on-the-job" cleaning. The same type of plug which operates satisfactorily in the gasoline-starting diesel usually will perform well in the Hesselman type. Figure 14 (A) shows a typical oil engine or "diesel type" plug where,—from the electrode arrangement, it can be seen that it would operate considerably hotter than conventional automotive types. Due to its heat range and physical dimensions, it cannot be used in gasoline engines.

NATURAL GAS ENGINES

Heavy-duty, slow-speed engines burning either natural or artificial gas require a special plug capable of exceptionally long life, as it is not unusual for large units in central power generation and pumping service to run a year or more without interruption. Due to the inherent characteristics of natural gas which averages 60—90 percent or more methane, depending upon the source, some investigators report that substantially more energy is required for ignition than for other heavier hydro-carbon fuels of higher molecular weight, e.g., gasoline or diesel fuel. The higher energy requirement would necessitate a fatter, hotter spark and, as such electrical characteristics would rapidly burn nor-



Left, Fig. 14A; right, Fig. 14B.

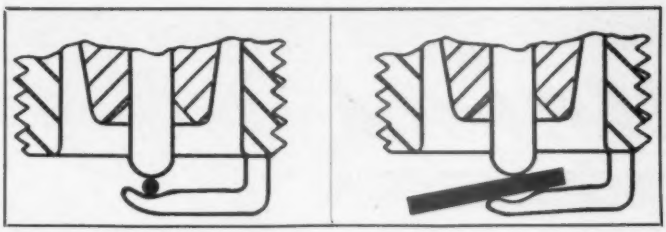


Fig. 15. Sketch showing difference in accuracy between round wire gauge (left) and flat gauge (right) in checking gap width.

mal electrodes, a gas engine spark plug may have a large sparking surface, as can be seen in the plug illustrated in Figure 14 (B). Some natural gas engines must also operate on raw gas containing appreciable amounts of sulphur. During combustion "sour" gas, as it is known, forms sulphurous acids which have a corrosive action on most engine parts including the plug electrodes. For such applications, the chemically-inert nature of the platinum electrode plugs have been well suited.

SPARK PLUG SERVICING

For maintaining peak plug performance, periodic inspections and checking are necessary. Spark plug cleaners marketed by the various plug manufacturers, in general, clean the firing ends by impingment of fine, dry, abrasive particles in a high-pressure air jet. Usually five to ten seconds of "sand blast" are sufficient. Prolonged blasting wears away the electrodes and insulator as is shown by the uneven core noses of Figure 8; this affects heat characteristics. Lumps of hard carbon deposits can be easily removed from the steel shell with a wire brush or sharp knife. Care must be taken not to scrape the ceramic insulator with any metal such as a knife blade because the abrasive surface of the insulator can pick up a minute amount of metal, leaving a conducting track on the surface. Although scraping the center insulators is not so bad when they are glazed and smooth, the unglazed ceramics can pick up sufficient steel to cause misfire.

If the plugs are oily or wet, they should be first dried by a rinse in naphtha and an air jet before blasting because if wet, the abrasive granules will clog and do an inefficient cleaning job.

When the deposits are all removed, the gap should be reset, according to the manufacturer's specifications, by bending only the outside, ground electrode. During the adjustment of the side electrode, care must be taken not to accidentally apply any pressure against the center electrode, nor to attempt to adjust the gap by bending the center electrode as any strains may induce cracking of the insulator tip.

Gauging the gap width is best accomplished with a round wire feeler gauge, rather than a flat gauge. Worn electrodes frequently will be set too wide if a flat feeler gauge is used, although flat-dressed points are not affected. Figure 15 shows how a round wire gauge accurately checks the gap whereas a flat gauge, by improperly fitting the gap, gives a faulty measurement. In the illustration, the gap actually measures 50 percent greater opening than the flat gauge indicates.

Dolomite-Magnesium Agstone

(*From page* 78)

fertilizers in the same sense that N-P-K were added earlier. All of them are in the same royalty class of fertilizers. The wise farmer will not allow magnesium to become deficient in a soil and the wise producer of agstone is ready to supply a magnesium-containing agricultural stone where it is needed.

Industry and Wisconsin U. Sponsor Diesel Symposium

Top experts of the nation had an "inside look" at some of the newest parts of diesel engines at the six-day symposium on diesel engineering held at the University of Wisconsin, August 29-September 3 inclusive.

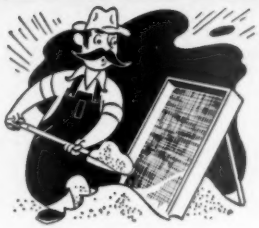
Sixteen of America's largest engineering firms which make parts or products used in diesel engine operation had exhibits at the symposium, and more than 175 diesel experts from colleges and universities and from diesel engine industries participated.

The meeting, sponsored by the State University in cooperation with the Diesel Engine Manufacturers' association, was held to promote a closer cooperation between the personnel of the diesel industries of America and the schools which train men for the field.

Organizations showing exhibits at the symposium were the Cleveland Graphite Bronze Co., Woodward Governor Co., American Bosch Corp., Commercial Filters Corp., American Air Filter Co., Young Radiator Co., Nordberg Mfg. Co., Illinois Testing Laboratories, Inc., Fram Corporation, William W. Nugent & Co., Houdaille-Hershey Corp., Sealed Power Corp., Air Maze Corp., The Texas Co., Manzel, Inc., and Scintilla Magneto Division.

• A round-the-clock operation, six days a week, during which the engine never gets cold, is the job being done for Cooper Supply Company, Detroit, by this Mack LJT tractor, the sixth such Mack to be added to the company's fleet. Hauling about 26 yards of gravel or other aggregates for a total gross train weight of 104,000 to 117,000 lbs., the unit works constantly on 64-mile round trips, 60 miles of which are over paved roads and four on improved gravel.

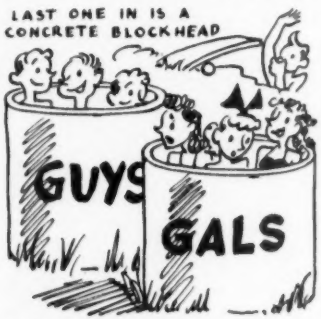
Screenings



by William M. Avery

THE last hot days of an extremely hot summer injected touches of madness even into the normally sedate precincts of PIT AND QUARRY. At Memphis a dump truck with the slogan "we move the earth" printed on its side, produced a fair-sized tremor by crashing into a truck mixer loaded with 9000 pounds of concrete. Several wedding ceremonies were performed in underground limestone quarries where the temperatures were 30 to 40 degrees cooler than on the surface, and where, presumably, no one would take exception if the groom's teeth chattered a bit as he muttered the fatal words.

An Associated Press dispatch from Lincoln, Vt., described the use of up-ended sections of concrete pipe for bathhouses at the old swimming hole. This, said the item, was done



in the interest of modesty, and the point was proved with a photo in which small heads peered from two sections of pipe standing edge to edge, one labeled "boys," the other "girls," with either group enjoying an unobstructed view of the other.

The Russians made news in a small way by claiming that they were really the first to manufacture portland cement, and several punsters were quick to point out that this at least had the virtue of being a concrete claim. Officials in other countries refused to say whether or not they favored adopting the name Port Vladimir cement in recognition of the Soviet priority.

Fish Story

AN ITEM from Australia tells about a guy who caught a dozen large trout with a bulldozer while he was allegedly scooping

gravel from the London River. The method strikes us as a bit too unorthodox to gain wide acceptance, but you can't ever tell about fishermen. They're almost as distinctive a species as fish.

Sand vs. Taxes

ON the whole we're inclined to take a dim view of a recent press dispatch from England telling about a Norfolk village that runs on sand. Seems the 700 villagers haven't paid a penny in local taxes for the past 15 years because profits from a village-owned sand pit are sufficient to take care of all community expenses.

There must be an Ethiopian concealed somewhere in that lumber pile. There's probably a law on the books requiring every resident to buy a minimum of two tons of sand annually at $100 a ton. That's the only way we know of that any government ever managed to show a profit on its operations.

How's That Again?

WE'RE thoroughly in agreement with an editorial that appeared not long ago in the Baldwin Locomotive Works' *Testing Topics*, urging the use of simple, intelligible language in place of the highfalutin verbiage with which almost all so-called technical writing is burdened. "If the present trend continues," the author writes, "it is possible that an electronics engineer could expound for hours and a mechanical or electrical engineer fail to understand him."

Well, now, we think that stage was reached and passed a long time ago. Today it is not only doubtful if another electronics engineer could follow the discussion, but highly unlikely that anyone within earshot would even take the trouble to listen. We've had the dreary task of trying to take notes on several thousand technical papers presented at conventions, and in most instances we've been lucky to get down the name of the author and the title of the paper. Only reason we get that is because it's usually printed in the program.

Cement Pirates

AN item from Hong Kong states that pirates brandishing machine guns boarded two junks in the Pearl River near Canton and stole an estimated $250,000 worth of cement and sugar. Time was when no self-respecting pirate would even bother to look at a haul like that, but apparently things are tough all over right now. Our personal preference is still for the old brand of

operator who specialized in pirating beautiful damsels and treasure chests. Those Pearl River guys are just storekeepers at heart.

Prevention and Arresting Of Corrosion and Rust In Plant Equipment

LOSSES TO nonmetallic minerals production properties, metallic facilities and equipment whether subteranean or aboveground have not only been a source of vast losses over the years but also a

By JONAS HOWARD

matter for close studies in the field of prevention. It is a well known fact that these losses cannot be counted only in dollars, through the corrosive depreciation of the equipment and property, but also in safety and slowdown factors. Although it is not easy to estimate these annual losses with any exactitude, some expert opinion is available which provides a sort of yardstick for the pit and quarry trade.

Quoting K. G. Compton, *Finish and Corrosion Engineer,* Bell Telephone Laboratories, an authority on this subject:

"The estimated cost of corrosion (in the world) of upwards of $10,000,000,000 a year should be multiplied tenfold were it not for the use of protective coverings. In this country alone the annual cost of raw materials for use in such protective coatings exceeds $500,000,000. The labor cost for the application of protective coatings is several times the raw materials cost; so it is evident that the proper selection and evaluation of protective coatings assumes a role of considerable importance to the economy of the industry and the whole country's vital activities."

From time to time the pit and quarry man feels it of first importance to consider the newest thoughts on this subject of resisting corrosion and the progress that is being made along lines of prevention.

Of course, the processes of corrosion vary with climate, local conditions, surface conditions, and materials in this and many other industries and fields of activity. Yet in general the war against the monster R-U-S-T is being scientifically waged in the general interests of human activity.

Let us consider here some interesting facts: It has been held by authorities that, by a conservative estimate, loss through rust (of iron and steel and in an overall sense) requires the replacement of about 2 percent each year of the entire tonnage of 15,000,000 to 20,000,000 tons of iron and steel are "lost" annually in the United States in this way. This fact, it will be seen by those responsible for upkeep of equipment and machinery, places a high cost on the use of these metals.

The whole subject is already touched on, while dealing with a fundamental principle, is complicated throughout our wide industrial, agricultural and transport field by the degree of deleterious effects on these metals of such varying elements as weather, acids, contacts, degree of exposure, and time.

It has been repeatedly pointed out by experienced engineers that the potential losses through rust and corrosion in any activity making important uses of metals indicate the need for "insurance" against them, just as insurance is universally assumed against fire. Great strides have been made in the last generation looking to the improvement of methods and facilities to prevent and reduce rust. In the meantime, investigatory work goes forward.

The National Association of Corrosion Engineers, for instance, has set up a technical committee to collect specific information about the economic effects of rust. The report of this committee does much to further the research work previously done in this field.

According to Norman E. Hanmer, editor of *Corrosion Magazine,* "The problem of mitigating corrosion seems to be one of preventing materials from returning to the state in which they were found *before* fabrication. At best this can be only partially successful."

It has been pointed out that one of the things which has stood in the way of awakening interest in corrosion and its destructive powers is the fact that for the most part its very action is *insidious.*

Mr. Hanmer continues: "The more spectacular aspects in which large structures, machinery or equipment show the ravages of their environment may be the most striking, but they are not necessarily the most important from the standpoint of economy."

Nearly all users of machinery and equipment have at least some of it exposed to air and weather, while part of it must fight the war for survival against rust underground. The annual total loss to America due to repair and replacement of *underground* structures, plus the costs of lost commodities, lost income and contingent losses caused by underground corrosion is estimated to be around $1,000,000,000.

In considering the advances made to increase the effectiveness of various protective methods and techniques during the last 25 years, perhaps those involving processed fish oil (with pigment) have been the most outstanding.

The discovery of this raw product as a preventive and protective for corrosion goes back some 25 years. It was the result of the experience of a sea captain who noted the ruthlessness with which rust ate into his ship's metal surface and parts. He also recognized the fact that fish oil tended to prevent and eliminate the effects of this rust. The experimentation that followed established the fish-oil-base preventive in the forefront of the war against metal property deterioration.

Other basic agents and other methods of combating rust and corrosion, e.g., red lead, zinc chromate and crude, and deodorized fish oil, have marked these advances most clearly. The successful deodorization of fish oil, which now comes in a wide range of colors and special purpose coatings, is perhaps the most interesting and important of these anti-rust developments.

Since the earliest investigations of corrosion, dating back nearly a century, progress has been made along two principal lines toward increasing the resistance of metals to the destroyer. One line of research has been directed toward the development of iron alloys which offer greater resistance to corrosion than the metal in its usual commercial state. Nickel and chromium alloys are the best known and most widely used in industrial service, either separately or together. Forming the bases of the rustless iron and stainless steel groups, they represent the best efforts to combat corrosion by composition. However, the relatively high cost of alloy metals removes them from serious consideration, except for decorative purposes, in the average applications to structural use.

To withstand severe conditions

copper-bearing steel is often used; and aluminum is coming into favor for window frames and sash. However wide the use of these corrosion-resisting metals, there remains a large tonnage of commercial and transport iron and steel which must be guarded by protective coatings to prevent disintegration. To this end the other line of research is directed. Here, the problem is to preserve existing equipment and structures. Painting is successful if the surfaces are properly prepared to receive the priming coat by the removal of mill scale, rust, dirt and grease This coat usually consists of linseed oil as the vehicle for a pigment such as red lead, iron and zinc oxides, or lead and zinc chromates. A handicap is the heavy expense imposed by the cleaning operation. In the search for a priming coat that could be applied directly over the rusted surface, industrial chemists found that pre-oxidized fish oil offers a satisfactory solution to the problem.

Such a product has been developed and has been used rather widely in spite of certain objectionable characteristics, such as slow drying, "tacky" surface, and a persistent odor. However, a new product has been perfected which has been in use long enough to warrant consideration as a new ally in the battle against rust.

Years of research were necessary to bring the fish-oil coating to its present efficiency, because it was necessary to develop a process of deodorization and to maintain constant control of drying. The coating was finally made to dry to touch within four to eight hours and to be applicable to a surface *already* rusty.

While the formula is not known, it has been determined that it contains a high percentage of fish oil. Treated to remove the odor, and pre-oxidized to hasten drying, the oil still retains its rust-inhibiting characteristics. It may be applied at any temperature above 45 deg. F. It dries readily and is reported to leave a firm, elastic surface that will take any conventional paint.

An additional feature of importance is its ability to carry pigment in suspension, enabling this product to function as a final coat under conditions that do not require a special finishing coat. As an efficiency vehicle, it successfully passes the requirements of the aluminum powder and paste manufacturers. This product has been favorably tested for protection of outdoor and indoor metal construction, shop and field coats for structural steel, and tank painting with or without pigment or aluminum flakes.

Another advantage of the fish-oil-base coating is said to be the peculiar ability to penetrate the pores of the metal and carry along the pigment to the clean metal undersurface. Moreover, it expels corrosive elements which cause rust deterioration; and the oil and pigment in it merge the rust into the film of the coating. The result of all this is a dense, a i r - t i g h t, rust-prohibitive coating which will arrest oxidation and prevent any future rusting.

In order to bring to bear the protective powers of fish oil to each type of corrosion, it has been necessary to combine the base oil with many pigments to produce coatings in the various colors required for transportation, agricultural, and industrial operations in varying utility and climatic requirements.

We are slowly realizing to what extent corrosion eats into profits and raises costs, especially in connection with the all-important matter of replacement of equipment, facilities and machinery. For a long time we thought we had to accept rust and its trail of destruction as a natural hazard, as we accept depreciation through every-day use. While the most modern and progressive methods are applied to general equipment and machinery upkeep, there is a surprisingly large percentage of instances where the rust factor is minimized or even ignored.

No amortization calculation is reliable which does not take into careful consideration: (a) the rate of depreciation through corrosion, (b) measures to reduce or prevent the rate of deterioration through rust, and (c) cost of such preventative measures—as calculated against such loss.

Nonmetallic, Cement Firms Report Record Earnings

Despite indications in some quarters that industry has slipped from the crest of an unprecedented wave of prosperity, business seems to be holding its own in the nonmetallic minerals field. This impression is gained from reports on current statistics released by leading producers.

Unaudited figures for the Warner Company showed net income for the first half of 1949 to be $1,210,071, as compared with $772,614 for 1948 and $654,513 for 1947. In 1949 earnings per share have been $2.55; in 1948 they were $1.62; in 1947, $1.37.

Texas Gulf Sulphur Company reported net earnings of $6,593,341 for the three months ended June 30, or approximately $1.97 per share. Last year during the same period earnings were $1.67 per share. Freeport Sulphur Company's net income for the first quarter of 1949 amounted to $1,236,227, or $1.55 per share, whereas last year's corresponding period showed net income of $874,672, or $1.09 per share. Another firm in this classification, Duval Texas Sulphur Company, showed 1949 second-quarter sales to be $1,001,726, as compared with $635,790 in 1948 and $1,041,968 in 1947.

According to National Gypsum Company's semi-annual report to stockholders (June 30, 1949), the net profit figure for the second three months of the present year stood at $900,133 and the amount for the 6-month period reached $2,414,462.

U. S. Gypsum Company's net earnings for the first quarter of 1949 reached $5,311,542, or $3.24 a share on common stock. Last year won by a narrow margin; net earnings stood at $5,332,029, or $3.25 per share in 1948.

For Alpha Portland Cement Company, the 12-month period ended June 30, showed the net income to be $3,348,817; for the corresponding period in 1948 the figure was $2,050,645; for 1947, $1,631,527.

Net profit for the first quarter of 1949 for Lone Star Cement Corporation was reported at $1,586,718, as compared with $912,736 for that period in 1948.

Lehigh Portland Cement Company recorded net income of $5,823,587 for the 12 months ended March 31.

Net earnings of the General Portland Cement Company for the first six months of this year were $2,547,800 or $2.50 per share of common stock, as compared with $1,859,300 or $1.82 per share last year during the same period.

Figures for the quarter ended March 31, 1949, showed that Halliburton Oil Well Cementing Company's net profit stood at $1,203,460; last year the figure was $977,140.

Canadian Mining Declines— But Revivals Brighten Picture

According to the *Canadian Mines Handbook*, 1949 edition, the mining industries in Canada are at present experiencing a slump. Whereas in 1946 a total of 1,765 companies were active, the number decreased to 842 in 1947 and to a low of 760 in 1948.

However, it was pointed out that revivals had shown an increase, with 69 concerns previously inactive returning to the active list. The total list of mining companies—active and inactive—numbers 8,465, an all-time high.

According to the *Handbook*, "the most important new feature of this year's edition is the inclusion of asbestos mining companies which, though only a dozen in number, include some of the whole mining industry's largest tonnage operations."

Two co-distributors have been announced for Lite-Rock, a plaster aggregate made of expanded perlite: Columbus Builders Supply, Inc., and the Columbus Coal & Lime Co., both of Columbus, O.

Illumination in Cement Plants

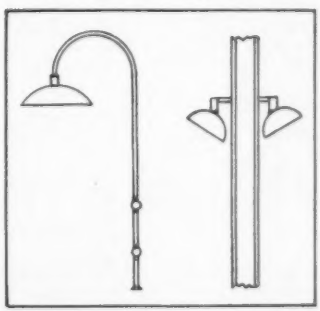
WHILE it is true that high intensities of illumination are not required in cement plants as a rule, nevertheless, good general lighting is requisite not only as a matter of safety but also to insure inspection

By LEO DOLKART
Consulting Engineer

of machinery and to keep constant check of the process of manufacture. It is fallacious to assume that since no fine or intricate parts are manufactured in a cement plant that the lighting need be given slight consideration. Since most of the machinery is of the large and massive type, low intensities of from 4 to 8 foot candles suffice for many places. The few exceptions to this rule are locations such as over weighmasters, sampling places, at bagging machines, kiln firing floor, pump rooms, machine and repair shops, switchboard rooms, motor generator rooms, and, of course, various laboratories and offices.

Owing to the nature of the type of manufacturing business, the extensive use of elevators and overhead conveyors and bins, high buildings are often the rule. This is particularly true of the crusher and mill buildings. In most cases it has been customary to use ceiling units, often haphazardly spaced or sprinkled like pepper and salt, all depending upon the ingenuity or whim of the plant electrician. While in most cases these units may have reflectors, very often they do not. Often, due to a false economy in wiring, when large but fewer units are used the average intensities are low and the general lighting effect is very spotty. This results from the

Fig. 1 (left) and Fig. 2 (right).



Ing. Rodriguez, manager, Allis-Chalmers, Mexico; Leo Dolkart, chief electrical engineer; Ing. Jose Rivera R., general manager, Cementos Portland del Bajio, S. A. This photograph was taken at the Leon plant while under construction.

fact that the lighting units are placed too low and too far apart. The writer's own experience indicates that often angle reflectors can be utilized as more efficacious for use in lighting high areas, such as mill buildings, crusher buildings, etc.

The presence of a large amount of dust incidental to the industry, makes accessibility for cleaning lamps and reflectors imperative. Where costs are not too prohibitive and funds permit, dust proof porcelain enameled reflectors should be used. Since in most cases overhead cranes are not customarily provided in high buildings, high ceiling units prove costly for installation as well as inaccessible for replacement and maintenance of lamps.

In lighting offices and laboratories a uniform level of illumination can best be attained by spacing the ceiling units uniformly either two or four per bay, depending upon the type or architectural structure of bay used. The mounting height of the luminaire or lighting unit used depends upon the type of unit that is selected. The actual method of calculation of proper illumination levels is made from the following equation and which is taken from the I E S Lighting Handbook (Illuminating Engineering Society):

$$Eav = \frac{F \times Ku \times Km}{A}$$ Where

Eav = average illumination maintained in service on a horizontal working plane, 30-in. above the floor.

F = total initial light flux from all lamps (lumens)

Ku = coefficient of utilization (a dimensionless ratio).

Km = Maintenance factor which compensates for the in-service reduction in light output of lamps and reflecting surface (a dimensionless ratio).

A = floor area in square feet.

These various functions are obtained from tables listed in the handbook and cover various types of luminaires for mazda and fluorescent lamps.

The equation and tables are usually applicable for the computation of illumination for areas that are found in offices, laboratories, machine shops, store rooms, warehouses, etc., areas that are practically free from shadows due to high machines. Areas where machinery interferes with proper distribution of light from ceiling units, can often be illuminated with angle reflectors. Their exact location can be determined from a study of the distribution curves of the particular reflector selected.

Passageways are economically lighted by ceiling units, placed sufficiently high enough to be out of the line of vision and close enough not to appear too spotty. An examination of the distribution curve for the unit used will readily indicate just how far units should be spaced. Catwalks, platforms and runways along conveyors, above elevators and above silos are best lighted by means of reflector units usually supported from pipe guard rails and as shown

in the illustration, Fig. 1. Ladders leading to platforms and to tops of silos should be provided with lighting units above ladders. Since catwalks, and runways, platforms and ladders are in use at night time, safety demands that these be sufficiently lighted.

One of the most difficult problems of lighting in a cement plant is that of a mill building. This building is usually very long, narrow compared with length, and from 50 to 60 feet in height. Such equipment as overhead conveyors, elevators, and bins prevent suitable overhead lighting. Clinker and gypsum mixing machines, usually located on a balcony, also interfere with proper overhead units. Then to complicate further the use of overhead lighting is the necessity of installing raw and finishing mills often in pairs, one on a higher and one on a lower level. In such cases the writer found that the use of angle reflectors lends itself to an admirable solution of the lighting problem. The attached diagram of such a typical floor plan and elevation section, Figures 2 and 3 and night pictures, Figures 4 and 5, of a cement plant recently completed in Mexico, illustrate what can be done. The pictures are unretouched time exposures and are not flashes. In this plant the angle reflectors are mounted on the structural columns, 20 ft. on centers and at a mounting height of 19 ft. 6 in. In the typical floor plan, Figure 3, the columns are located between the pairs of mills, there being two center columns. In the floor plan one will note that the center columns have two angle reflectors each while the two outer columns have one reflector each.

The actual illumination of this mill building as indicated by foot candle meter readings varies from 4.5 to 5 foot candles. These tests, taken at night, were made after reflectors were in use several months and so were partially covered with

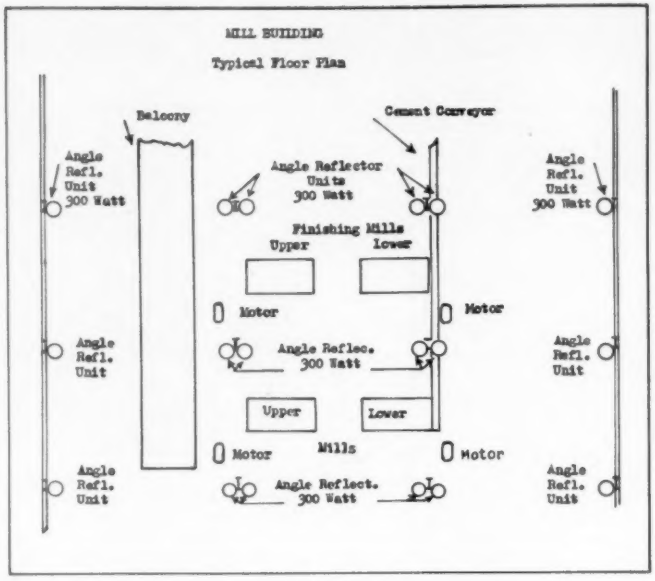


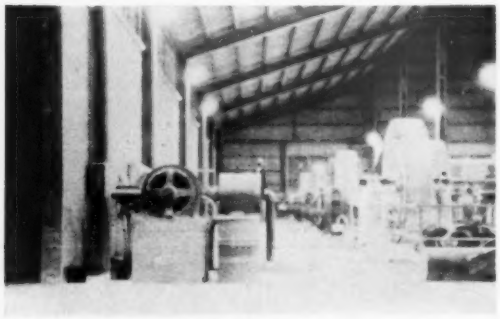
Fig. 3

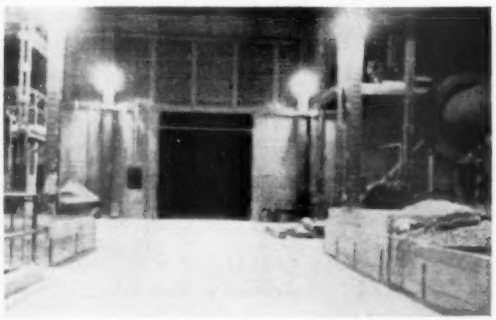
dust. This was done to indicate actual operating conditions. Since in a mill building no close work is required, this illumination is ample for oiling of machinery, taking of cement samples and general supervision over operations. In this particular installation each of the center columns was provided with a duplex receptacle for the use of extension cords. These are very often useful for repair work inside the mills and on motors and conveyors.

Machine and repair shops can usually be best lighted by the use of large ceiling units, uniformly spaced and placed high enough to eliminate shadows. If the system is properly designed, practically no supplementary local spot lighting is required. For bench work a special row of units over the bench should be provided. Along the wall and above the bench should be provided a series of duplex receptacles for the use of portable drills, soldering irons and other portable electrical tools. Levels of illumination of 25 to 30 foot candles are customary for machine and repair shops.

Offices and laboratories should be provided with high levels of illumination; 30 to 50 foot candles are customary levels. Various types of fluorescent and mazda decorative luminaires are on the market. A choice of these should satisfy the aesthetic as well as the financial requirements. As stated previously, the architectural structure of the bay will determine whether two or four units will prove most satisfactory. Here again, floor and wall receptacles should be amply provided. These are for the use of ever increasing availability of adding machines and other office portable electrically-driven equipment.

Fig. 4 (left) and Fig. 5 (right).





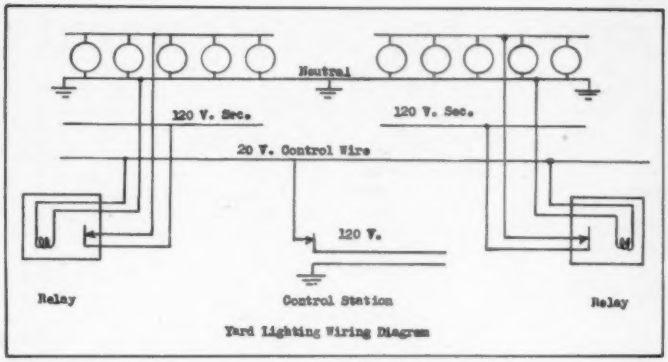


Fig. 6

The main limestone crusher and working space, if the ceiling is not too high, can well be illuminated by ceiling units. If the building is high and if elevators, bins, screens and conveyors interfere too much, angle reflectors can be placed on columns to give uniform intensities of from 5 to 6 foot candles. The gypsum and clinker crusher can usually be well lighted by ceiling units placed above crusher.

Floor levels under silos usually house conveyors, apron feeders and rotary bin valves. Ceiling units with porcelain enameled reflectors can be located so as to illuminate the conveyors as well as the passageways. Levels of illumination of 5 foot candles are ample for this purpose. Since mechanical conveyors or air control valves for air conveyors are located on top of silos, lighting units shown for catwalks provide good illumination.

The packhouse must be provided with ceiling units so located that the operators do not produce shadows on the bagging machines. From 15 to 20 foot candles should be provided to insure proper levels of illumination. The cement bag storage floor as well as the loading platforms require 4 to 6 foot candles of illumination. Ceiling units, properly spaced, supply good sources. Loading platforms, in the event cars are loaded at night, should be provided with receptacles for the use of portable spotlights to facilitate loading freight cars at night. These portable spotlights should be provided with stands and heavy bases so that they may be easily moved about inside of cars. There are various types of these lights on the market, some adjustable so that height and angle of spot may be varied.

The kiln firing floor with its temperature control panels, motor speed controls of kiln motors and associated equipment, fuel controls, etc., requires high levels of illumination. From 15 to 20 foot candles supplied by proper ceiling units usually proves sufficient.

The substation, substation switchboard, motor rooms, motor generator rooms, fuel pump rooms, clay storage rooms, clinker drying room and clinker storage space can be most easily and economically lighted by porcelain enameled ceiling type reflectors.

No mention of proper plant lighting can be complete unless some reference is made to the location and use of receptacles for extension cords. Every kiln, mill, machine, motor elevator and conveyor should be provided with its own receptacle for the use of an extension cord for exploratory and repair purposes. It is also suggested that the store room keep on hand various types of extension cords as well as of various lengths. These will be found of great help in emergency cases. For work inside of kilns very long extension cords are required, depending upon the length of the kilns. These should be of extra heavy duty type, with insulation able to stand warm temperatures as well as to withstand abrasion.

Modern trends now recommend the use of circuit breaker panels instead of fuse panels. This applies not only for the control of lighting circuits but also for power circuits as well. Circuit breaker panels facilitate the re-establishment of service in cases of momentary shorts or overloads. Prevention of improper overfusing insures proper limit of equipment or lighting current carrying capacity.

Since a cement plant depends upon its operation on a 24-hour schedule, sufficient plant yard lighting must be provided. Where overhead distribution is used in a plant, yard units similar to street lighting units can easily be suspended from distribution poles. Where underground distribution is in use, similar units can be attached to the buildings. There are on the market various types of arms suitable for fastening to distribution poles, buildings or special lighting poles. From these arms are suspended regular street or yard lighting units. These may be of the porcelain enameled type, prismatic or diffusing glass type. In designing a yard lighting system it is well to bear in mind that the lighting units should be mounted high enough to eliminate glare and blinding effect. This blinding effect bears an inverse ratio to mounting height, the lower the unit, the more the glare and the higher the unit, the less the glare. Once the type of lighting unit is decided upon, the lighting distribution curve of that particular unit will determine the mounting height and spacing of the units. The intensity of illumination need not be greater than .20 foot candles. Relay control systems can economically be used for the operation of yard lighting systems. The diagram for yard lighting (Fig. 6) shows how the entire yard system can be controlled from one control point and still be supplied from two feeding sources. This is of particular advantage where industrial plants occupy extensive areas. Loss of voltage over long lines is thereby avoided. Another advantage of a control relay system is that it becomes possible in a closed relay circuit system to operate lights when the control circuit fails.

The subject of industrial yard lighting can not be complete without mention of protective or fence lighting. In many instances flood lighting of fences is not only desirable but also necessary. Such protective boundary lighting is accomplished by the use of floodlights, reflectors or projectors. It is self evident that protective lighting can only be effective if a sufficient corps of guards is employed. Levels of illumination of from .15 to .20 foot candles is ample. One caution should be used in designing a protective lighting system and that is the elimination of all glare from the patrolling guards while they pass along the inside of the boundaries.

What has been previously said about the illumination of cement plants applies equally as well to nearly all of the crushed stone, sand and gravel and other non-metallic minerals operations. This subject of illumination is not complete unless

(*Continued on page* 88)

Report on Current Labor Developments

Minimum Wages

another P-Q exclusive

AT THIS writing it appears virtually certain that the minimum wage will be raised to 75 cents at this session of the Congress.

Other features of the law have been the subject of extensive and frequently bitter controversy. Much

By S. HERBERT UNTERBERGER
Director of Research Labor Relations Information Bureau, Washington, D.C.

of the argument has centered around the question of additional exemptions from the coverage of the Act. Even if all the exemptions now proposed become law, they will have practically no effect on these establishments in the pit and quarry industries which are covered by the law.

It is well to keep in mind, however, that many pit and quarry companies are not covered at all by the Fair Labor Standards Act, because they are not engaged in interstate commerce. Whether a particular establishment is or is not so engaged can be judged only on the basis of all the facts regarding that establishment. In making that determination, many factors must be considered. Among the most important of these are: (1) the amount and proportion of raw materials purchased outside the state, (2) the amount and proportion of finished product sold and delivered outside the state, and (3) the use to which the finished product is put.

With the minimum wage rising, many companies may find it worth while to examine carefully the question of whether they are in fact covered by this law.

Employers and Unions Equally Guilty

Recently, an important case has been decided by the National Labor Relations Board in which both an employer and a union were found guilty of violating the Taft-Hartley Act. They were ordered to reimburse an employee who had been illegally discharged for the wages which he had lost thereby.

To understand how this can happen requires a review of two features of the Taft-Hartley Act. For the first time, that act outlawed the closed shop and the union shop unless it was specifically authorized by a special election. Enforcing a closed shop or an unauthorized union shop is an unfair labor practice.

Also, for the first time, that law made it possible for unions to be guilty of unfair labor practices.

In this case, the union insisted that a particular employee be discharged because he had failed to pay his union dues or else it threatened to strike. The union did not have a legal union shop agreement with the employer. The employer discharged him.

The NLRB held the employer guilty of discriminating against the discharged employee and it held the union guilty of causing discrimination. It ordered them jointly to pay back the wages lost by the employee. It did not say how much each owed.

Outlawed Hiring Practices

A similar principle has been developed with respect to hiring practices.

For many years employers in the construction industry and in industries related to it have been in the habit of making contracts with certain A.F.of L. unions to supply all the labor needed for a particular job. This was never challenged as discriminatory because prior to the passage of the Taft-Hartley Act the NLRB did not concern itself with the construction industry.

Since the passage of that law, the NLRB has been asserting its jurisdiction. It has ruled on several cases in which a man applying for a job for which he was qualified was rejected because he was not a member of a particular union with which the employer had a contract. Generally the NLRB has ordered that the man so discriminated against should be reimbursed for the wages lost because of failure to secure the employment.

The NLRB rulings are based on two points. First, the Board says that these contracts are not legal because they were made before the union represented a majority of the employees. Secondly, they are illegal because they prevent the employment of workers who are not members of a particular union. This is an unlawful closed shop, or at least it is a union shop; but since no special union shop has been held, it is equally unlawful.

Employers who enter into such arrangements should recognize that they are agreeing to something which may ultimately turn out to be very expensive. This is so even if they are merely oberving a contract which may have been in effect for many years. An employer who argued that way was told that he should have changed the contract or should not have observed it when living up to it was no longer legal.

Union Entitled to Merit Rating Data

The area of collective bargaining will be extended one more step if the NLRB agrees with its trial examiner in a case involving the question of whether the union is entitled to see a list of all merit ratings and pay raises based on those ratings. The examiner ruled that the employed had to give the union such information. He ruled in that way because the ratings, as well as promotions, lay-offs, discharges, and other actions based upon them, were subject to the grievance machinery of the contract.

On the other hand, the examiner said that the company was within its rights under the contract in refusing to consult with the union before granting merit pay increases.

Employers might as well recognize that under existing legislation there are practically no aspects of the employment relationship which are not subject to collective bargaining if the unions insist upon it. The Taft-Hartley Act actually advanced this trend. It legislated on many subjects about which very little bargaining had occurred, thereby making them appropriate subjects of collective bargaining.

Illumination

(*From page* 87)

some mention is made of illumination of quarries for night operation. This is usually done by means of floodlights of 1000- or 1500- watt types mounted on poles 30 to 40 ft. high. The height and type of quarry face that is worked will determine mounting height, spacing and beam spread of floodlights used.

After all is said and done, proper lighting properly installed is as much of a necessity to a manufacturing process as is the producing machine or the motor that supplies the power. Elimination of safety hazards and assurance of continuity of production warrant expenditures for adequate lighting. One will benefit in installing a proper lighting system in direct proportion to the effort one expends in designing a system to suit actual requirements.

Charles H. Fieldhouse recently purchased the White gravel pit property near Elkhart, Ind., operated from 1923 to 1936 by Leroy R. White.

More Information, Please!

CHECK AND MAIL THE CARD BELOW FOR ADDITIONAL INFORMATION ON NEW MACHINERY AND SUPPLIES

1. Behind the Scenes with Big Yellow Machines. Form 12594. 16-page booklet featuring the precision processes behind "Caterpillar" diesel track-type and wheel-type tractors, engines and earthmoving equipment. Contains many photographs illustrating laboratory research methods. Two full pages devoted to a description of "Caterpillar" fuel injection equipment. The Caterpillar Tractor Co.

2. Denver Portable Concrete Mixer. Bulletin No. M13-B1. 4-page folder picturing and describing the various models of this mixer. Contains a keyed drawing of the device, a table of suggested concrete mixes, specifications, and prices. The Denver Equipment Co.

3. Mighty-Mite Light-Duty Vibrating Screen. Flier presenting major features of this screen, with many suggested applications. Screen Equipment Co.

4. Joy Core Drill Supplies and Equipment. Catalog—Bulletin D-18. 56 pages. Contains illustrations and specifications for a complete line of core barrels, bits, drill rods and other related equipment. Joy Mfg. Co.

5. Ludlow-Saylor Wire Co. Catalog. Illustrations and descriptions of all types of wire cloth and screens are supplemented with views of these products actually being manufactured. Ludlow-Saylor Wire Co.

6. Seven New Ways to Mix and Place Concrete at Lower Cost. 8-page folder describing a job in each of seven construction fields. An action picture of the job, a view of the plant and a list of equipment appear on each page. Versatility of Dumpcrete bodies (non-agitating) is fully illustrated. Dumpcrete Division, Maxon Construction Co., Inc.

7. Link-Belt Speeder LS-71 Shovel Crane. 16 pages. Catalog No. 2312 contains many photographs and descriptions of various applications for this ¾-cu. yd. shovel-crane. Link-Belt Speeder Corp.

8. Model 423-6A Specification Bulletin No. 1025. Contains general and complete specifications for this power unit, photographs, sketches and graphs. Minneapolis-Moline Co.

9. Kwik-Mix Moto-Bug Power Wheelbarrow. 4-page catalog showing actual photographs of the Moto-Bug with attachments to fit it for many applications. Schematic diagrams and engineering specifications are included, in addition to a concise summary of design and performance. The Kwik-Mix Co.

10. Bulletin No. A129. 32 pages. Describes a new line of Series 500 air-operated controllers. Contains full descriptions of instruments for automatically controlling temperature, pressure, flow, liquid level, humidity, and pH value. Complete data with illustrations for on-off, proportional, reset, derivative, and reset plus derivative models. The Bristol Co.

11. Bulletins on Bin-Flo Aerator Units. One gives complete information on the operation and use of these units, including typical layouts, applications and air supply data. The other contains specifications and prices. The Bin-Dicator Co.

12. Improved Industrial Vision. A brochure describing sight conservation programs in industry. Features case histories and charts demonstrating cost-saving values of an industrial safety and visual efficiency program. American Optical Co.

13. General Electric Gear-Motors. 16-page bulletin defining the gear-motor and explaining its operation and performance. Other sections cover the following topics: how the G-E gear-motor benefits you; the planetary-gear system; fractional-hp. gear-motors; integral-hp. gear-motors; selection of gear-motors; what you should know before selecting a gear-motor; application photographs of gear-motors; electrical types and characteristics of G-E polyphase motors; hp. ratings of G-E gear-motors. General Electric.

14. Owen Buckets and Grapples. 28-page, five-color bulletin, copiously illustrated to show the versatility of this equipment. Tables of ratings, dimensions and weights supplement the text. The Owen Bucket Co.

15. How to Reduce Abrasive Wear with Thermalloy HC-250. 6-page bulletin describing the physical properties of Thermalloy HC-250, and listing uses and advantages. Case histories of the metal, giving actual field service data in each case, are included. Information on machining and high-temperature service is also given. Electro-Alloys Division, American Brake Shoe Co.

16. Reeves Vari-Speed Jr. 8-page bulletin completely describing this unit, designed for light horse-power requirements. Photographs, rating and dimension tables, and prices accompany the descriptive text. Reeves Pulley Co.

17. Sand Plants by Dorr. Bulletin No. 7291. Contains typical sand preparation flowsheets of specification sand and explains briefly the scope of the Dorr service available to sand producers—from raw material analysis to final supervision. The Dorr Co.

18. Don't Shovel Snow! Stop Chipping Ice! Vest-pocket folder describing the action of Ice Rem, a chemical product for melting snow and ice. Speco, Inc.

19. The New Rex 3½-S Skipper. Bulletin 49-16. On-the-job photos, closeups and descriptive matter present a streamlined story of this concrete mixer. Specifications are included. Chain Belt Co.

20. Colorcrete. Two bulletins describing a masonry surfacing which is sprayed on walls with machines. Colorcrete Industries, Inc.

21. Specifications and General Information for Standard Industrial Service Electric Overhead Traveling Cranes (Specification 49). Contains the following main sections: general specifications; trolley specifications; bridge specifications; girder specifications; and electrical specifications. The Electric Overhead Crane Institute.

22. Taylor Spiral-Weld Pipe. Bulletin

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October, 1949

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More Information, Please!

423. Contains tables showing available sizes and wall thicknesses and also Taylor forge fittings and flanges intended for use with Spiral-Weld pipe. Also includes a list of typical applications. Taylor Forge & Pipe Works.

22. Ruggles-Coles Rotary Dryers, Kilns, Coolers. Bulletin No. 16-D. 32 pages. Discusses direct, semi-direct and indirect heat dryers, double-shell and single-shell dryers, parallel-flow and counter-flow dryers, steam tube and hot air dryers. Includes overall dimensions of all models, as well as typical flow sheets showing how the various units are used in stone products and allied industries. Hardinge Co., Inc.

24. Waukesha Small and Medium Diesel Power Units. Pocket-size folder containing photographs and descriptions of four models and specifications for diesels, gasoline driven and butane- or natural gas-driven types. Waukesha Motor Co.

25. Weight at a Glance. Bulletin 575. 21-page bulletin on the Weightometer, "the original conveyor scale using continuous mechanical integration." Illustrated with photographs and sketches. Contains standard specifications, full descriptions of all types and other important information. Merrick Scale Mfg. Co.

26. Minneapolis-Honeywell Belfield Brass and Iron Cocks, Stop, Check, Non-Return and Transfer Valves, Swing Joints. Bulletin 100-1. Covers the Belfield line of extra-grade cocks recommended for shut-off service where long life and trouble-free operation are important. Contains many illustrations, sectional drawings, brief descriptions and a list of other items made by the company. Minneapolis-Honeywell Regulator Co.

27. Introducing Liddicoat Detachable Drill Bit. 4-page folder containing information in answer the queries: What is the Liddicoat bit? How is it used? What will it do? and Where is it used? Also included is a section on drill rod preparation. Calumet & Hecla Consolidated Copper Co.

28. Katolight Standby Power Plants. Flier describing 1-, 2-, and 4-cylinder air-cooled engines in seven models. Kato Engineering Co.

29. Allis-Chalmers Alternating-Current, High-Speed, Couple-Type Generators. Bulletin 05B6081B. Construction features and operation explained. A table of ratings of standard bracket bearing generators is included. Allis-Chalmers Mfg. Co.

30. Schramm Model 105 Engine-Driven Unistage Air Compressors. Bulletin 4915. 8-color, 4-page bulletin, fully illustrated, containing table of compressor and engine specifications, distinguishing features, and other important information. Schramm Inc.

31. It's No Secret—Oiled Pallets Act Better. Presentation of the B.M.T. pallet oiler. In addition to the description of the device, the folder contains operations and specification details. Bergen Machine & Tool Co., Inc.

32. Continental Belt Conveyors—Engineering Data Book ID-481. Lists special characteristics and gives a full description of each item, as well as tables of dimensions, list prices and average weights. Industrial Division, Continental Gin Co.

33. New American Model 410 Diesel Locomotive Crane. Catalog No. 600 L-7. Views of the machinery deck and of the entire 10-ton unit, a list of design features and specifications is contained in this 4-page folder. American Hoist and Derrick Co.

34. Catalog. Gives detailed design, engineering and performance data for the U. S. Rubber Co. line of transmission belting. Included are tables on belt speeds, arc of contact, friction, horsepower correction and service factors; also hints on proper selection of a belt and procedure for analyzing belt drives. United States Rubber Co.

35. Welding and Cutting Manual. A handbook on the oxyacetylene process. One chapter shows over 100 time- and labor-saving things to make. Another gives short-cuts and instructions for bronze-welding; fusion welding; soldering; hard-facing; cutting steel and cast iron; heating, forming, and straightening metals; welding and cutting pipes; and welding nonferrous metals. The Linde Air Products Co.

36. A Bull's-Eye in Hard-Facing Methods with the Colmonoy Spraywelder. Catalog describing the Colmonoy Spraywelder (a powder metallizing gun) and the Sprayweld process, in which powdered Colmonoy No. 6, No. 5 and No. 4 alloys, as well as other powdered metals are sprayed. Several hard-facing applications adaptable to Spraywelding are also included. Wall Colmonoy Corp.

37. Lubrication and Maintenance Guide for Contractors' Equipment. (Third Edition). Covers such topics as the following: engine lubrication, care of air cleaners, superchargers, oil filters, care of valves, wheel bearing lubrication, cold weather operating hints, storing equipment, bulk fuel storage, etc. Gulf Oil Corp.

38. How to Specify and Buy Alloy Steel with Confidence. 24-page booklet. Covers control steps for selecting and buying alloys. Explains the end-quench hardenability test, and gives data on buying alloy steel on the basis of hardenability and information on standard and special types of alloy and carbon steels. Publicity Division, Joseph T. Ryerson & Son, Inc.

39. Dillon Mechanical Pressure Gauge. 4-page folder containing salient features of this device, pertinent dimensions, numerous illustrations—all fully explained—and a price list. W. C. Dillon & Co., Inc.

40. B. F. Goodrich Armorite. Catalog section on abrasive-resisting rubber. Descriptions, illustrations, specifications and views of installations. The B. F. Goodrich Co.

41. Davey Field Service Unit. Flier describing a unit for servicing mining, construction, military and other machinery. The unit was designed as a companion truck for the Davy Mobile Machine Shop. Sketches and photographs show the arrangement of the unit, whose contents are listed. The Davey Compressor Co.

42. Keep Floors Safe with Tread-Sure. Presentation of a plastic brush-coating for floors, stairs and ramps. Contains directions for use and suggests applications. A. C. Horn Co., Inc.

43. The Bantam. 22-page bulletin presenting a unit which may be used as a shovel, trench-hoe, dragline, clamshell, crane, magnet, and pile-driver. On-the-job views, closeups of important parts and tables of specifications combine to present a complete story. Schield Bantam Co.

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PERLITE BY RYOLEX

By EDWARD BRUNENKANT

New Chicago Concern Invests $200,000 Perfecting Vertical Furnace for Expanding Perlite

ON THE SPOT

ALTHOUGH the inherent properties of expanded perlite as a useful lightweight aggregate have been recognized for some years now, commercial production has progressed at a snail's pace. Some of the difficulty can be traced to slowness in the development of foolproof expanding furnaces, some to the long distances separating the raw ore deposits from the logical sites of expanders near urban areas. Another possible factor is the natural hesitancy of capital to venture into a relatively new and still speculative undertaking in these days of confiscatory taxes. Despite the retarding effect of these and other factors, today there are a number of important expanders of perlite and several growing manufacturers of furnaces. Ryolex Corporation, 122 S. Michigan, Chicago, Ill., the subject of this report, is both a producer of expanded ore and a manufacturer of a vertical-type perlite furnace.

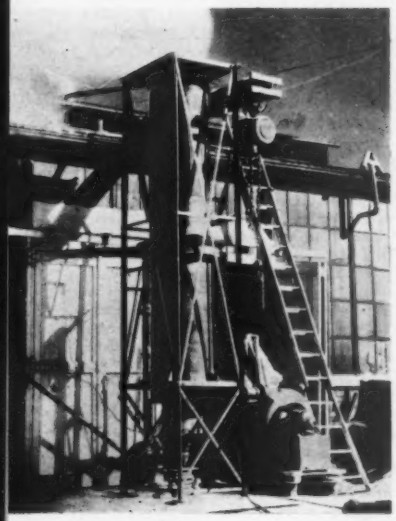
This company is the outgrowth of a strong conviction in the mind of the president, Ernest O. Howle, that perlite offered a superior replacement for the asbestos sheathing insulating a prefabricated metal chimney manufactured by another Howle company, Condensation Engineering Corp., of Chicago. Working closely with Ed Westberg of Glendale, Calif., a large western plaster contractor also interested in perlite, Mr. Howle built his first furnace in 1940. Since then, more than $200,000 has been spent on research perfecting the unit and foolproofing the process of "popping" perlite ore.

• E. O. Howle (left) head of Ryolex Corporation, and Carl Mendins Jr., engineer, who did some of the development work on the new furnace.

A few months ago we visited Howle's original Ryolex installation erected in Clearing, Ill., an industrial area just outside the city limits of Chicago. This plant is primarily a demonstration unit to show prospective Ryolex operators how the units functions. Although no serious attempt has been made to sell perlite in this area, enough customers call of their own volition to keep the plant running several days a week. In addition to supplying local customers, samples of the perlite product expanded here are sent all over the country to refrigeration, cosmetic, and metal polish concerns and a number of other industries interested in testing perlite for their own particular product. Sufficient interest in perlite already has been aroused in this manner to affirm Mr. Howle's faith and investment in the Ryolex venture.

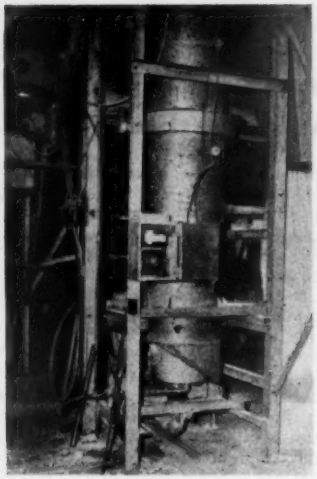
Essentially, the Ryolex furnace consists of a 30-in.-diameter steel tube extending vertically about 20 ft. The raw material, graded to pass an 8-mesh screen, is introduced into the tube at a point approximately 18 ft. from the bottom of the furnace. The rate of charge is controlled by a screw conveyor equipped with a variable speed drive.

As the "popping" temperature of perlite is about 1700 deg. F., and the fusing point is 2400 deg. F., successful exfoliation hinges largely upon rigid temperature control. Too much heat will fuse the perlite, causing it to stick to the sides of the furnace and necessitating a shutdown to clean out the unit. Too little heat won't expand the ore. In this furnace the temperature is measured by five thermocouples spotted at critical points around the inner periphery of the tube. Manual controls permit the operator to adjust both the draft and the gas to maintain the correct temperature.



•Below, left: The vertical-type perlite expanding furnace developed by Ryolex Corporation of Chicago. This shot was taken with the collecting hopper dismantled. The snowy-appearing material issuing from the top is "popped" perlite.

• Below, right: Unlimited quantities of raw perlite can be taken from the company's extensive property, located on the Santa Fe main line near Yucca, Ariz.



• A view of the Ryolex furnace set up for full-scale operation. This unit will expand perlite at the rate of 160 cu. ft. per hour.

• To provide the perlite aggregate for this cast section was the primary motivation behind the formation of the Ryolex Corporation. This section will be used to insulate a prefabricated metal chimney.

• All of the material is sold in 2-ply 4 cu. ft. bags, closed at the top with a wire tie.

Normally the draft, generated by two fans, one pulling and one pushing, is kept at a 4-in. vacuum. The gas is burned with a slightly oxidizing flame. About 2 percent of the weight of the raw ore is lost in ignition.

It takes about 10 seconds to expand the perlite. Upon expansion, the draft pulls the lower-density popped perlite out the top of the furnace into a steel hopper, where two gravity separations are effected.

It is obvious how delicate the draft adjustment must be, since too strong an air blast would lift unpopped ore into the collecting hopper along with the expanded product, frustrating the effectiveness of the furnace. Any foreign inclusions in the ore fall out the open bottom of the furnace, so that the collected product is for all practical purposes 100 percent pure perlite.

This furnace will produce about 160 cu. ft. of expanded perlite per hour. Two gravity separations are made directly from the collecting hopper: No. 1 material, weighing 7½ lbs. per cu. ft.; and No. 2 material, weighing 5½ lbs. per cu. ft. A further separation is effected with a small Link-Belt cyclone collector which draws off the fine dust at the bagging spouts. These fines weigh only 3 lbs. per cu. ft. All sizes of material are shipped in 2-ply, 4-cu. ft. bags closed at the top with a wire tie. According to tests carried out by the U.S. Bureau of Mines, No. 1 material has a K value of .31; No. 2, .28, and No. 3 perlite, only .22.

In order to supply their own expanding operations as well as the operations of purchasers of Ryolex equipment, the company has acquired rights to vast perlite deposits near Yucca, Ariz. The proven resources of this extensive holding, in excess of 1,000 acres, assures an adequate supply of easily-mined raw perlite ore for an indefinite period. When questioned about shipping costs, E. O. Howle had this to say: "Admittedly freight rates are high. Since, however, one cu. yd. of raw ore will expand into 15 cu. yds. of the finished product, the pro-rated cost of shipping is insignificant."

Undoubtedly, as the number of perlite expanders increase, the product will be adapted to more and more widely diversified uses. Interesting markets for perlite stimulated by Ryolex Corp.—in addition to the more usual ones such as plaster aggregate, and concrete aggregate—include its use as a soil-aerating material.

Explosives Research Reported In Mines Bureau Report

Two years of explosives research, highlighted by tests on new and safer explosives for the nation's mines, on the explosibility of ammonium nitrate fertilizer, the hazards of industrial gases, vapors and dusts, and improved methods of rock-dusting to prevent the spread of coal-dust explosions, is described in a new U. S. Bureau of Mines publication released by Director James Boyd. The report covers research on explosives, explosions and flames during the fiscal years 1947 and 1948.

Explosion hazards of more than 175 dust samples submitted to the Bureau by industry were determined. They included bituminous coal and lignite dust, graphite, insecticides, soap powders, penicillin, wood flour, corn starch, wheat, sulphur, cork, and plastics. Numerous Bureau reports on the results of tests were sent to commercial concerns upon request to assist them in preventing explosions.

At its experimental coal mine at Bruceton, Pa., the Bureau determined that the incombustible content of coal dust should be increased to at least 65 percent through rock-dusting, and that rock dust should be applied to within 40 feet or less of the mine faces in order to prevent the spread of a coal-dust explosion.

Prepared by Bernard Lewis, chief, Explosives Branch, Pittsburgh, Pa., and members of his staff, the publication contains many tables, charts and photographs.

A copy of Report of Investigations 4502, *Report of Research and Technologic Work on Explosives, Explosions, and Flames, Fiscal Years* 1947 *and* 1948, may be obtained free from the Bureau of Mines, Publications Section, 4800 Forbes Street, Pittsburgh 13, Pa. The publication must be identified by number and title.

3M Blast Tears 400,000 Tons Of Rock from Quarry Face

The first blast in the quarry of the Minnesota Mining & Manufacturing Co. near Corona, Calif., was detonated on August 6, bringing down an estimated 400,000 tons of well-fragmented stone.

The blast will provide a two-year supply of material for processing in the company's modern roofing-granules plant, which was described and illustrated in the February, 1949, PIT AND QUARRY.

Drilling for the blast required several months and consisted primarily of three 200-ft. coyote tunnels driven into the nearly perpendicular face. The explosive used was duPont Nitramon—125,000 pounds of it.

Until the blast, the granules plant had been using material brought down in earlier blasts when the quarry was operated by the Blue Diamond Co. of Los Angeles.

Streamline Portland Cement Plant

THE Kennedy-Van Saun Manufacturing & Engineering Corporation, New York City, believing that there is a need for a sound basic design for cement plants, has developed such a plan which is called the "Streamline." Patents covering this design have been applied for in all of the important countries throughout the world and to date have been granted in many of them.

In this design it was attempted to include all of the basic elements necessary to insure a portland cement plant that will be modern and flexible; that may be built at a minimum cost; and that will be able to easily produce all modern types of cements of the highest quality at a minimum cost of operation and maintenance.

In it have been combined the best of the modern departmental flow-sheets with the use of Kennedy-Van Saun machinery and equipment. The various process departments and supporting facilities have been located in a logical and simple manner along the sides of the bulk material storage structure, which is the heart of the plant.

Each department has been so designed and so located that it may be expanded many times in capacity without interfering in any way with the continuous operation of the plant and without encroaching upon the areas allotted for the growth and expansion of any other department.

This has been accomplished without sacrificing any of the overall plant efficiency from an operational or labor use standpoint. In fact, the location and grouping of departments is designed for the use of a minimum number of manjobs which is of vital importance in these days of high labor rates. Even though Kennedy-Van Saun is now building many new plants in areas where labor rates are low, experience has shown that low labor rates do not stay low. We therefore want all plants designed or built by us to be able to remain in a competitive position in spite of any future changes in the years to come. In addition, many of the plants now being built are small in capacity compared to United States standards. This makes it even more important that labor use be reduced to the absolute minimum by proper design since labor cost becomes such an important factor in the manufacturing cost of small plants.

The design of the buildings has been made as simple as possible to reduce this part of the cost of construction to a minimum. The walls of the buildings may be easily varied to suit climatic conditions found anywhere in the world without affecting the basic design of the plant itself.

Power use has been carefully studied and has been reduced to the lowest practical point by the use of the most efficient flow-sheets for each department.

The design of each department and the selection of the machinery and equipment has been based upon a proper balance between operating efficiency, cost of maintenance, and capital investment. Wherever applicable full advantage has been taken of the economies of closed circuit operation to obtain the maximum production with the minimum investment for machinery and equipment.

In every department the operation has been made as automatic as possible to provide the maximum control of quality throughout the plant and to reduce the number of skilled operators as much as possible.

One of the features of the "Streamline" plant design is the simplification of the transportation equipment throughout the plant. With the exception of one inclined pan conveyor and one screw conveyor there are no other mechanical material conveyors within the plant proper. The seven belt conveyors shown to deliver the raw materials to the bulk material storage structure comprise the entire remaining mechanical conveying group and these are trouble-free.

The accompanying drawing illustrates a typical wet-process "Streamline" portland cement plant. Should the use of the dry-process be indicated no basic changes in design are required other than the substitution of dry raw material storage and blending silos for the slurry thickeners and slurry storage and blending basins shown.

It is realized that no single design can be used for the construction of all plants but it is believed that the basic design can be used in most cases and that slight variations from it will take care of all special conditions imposed by property limitations or topography.

A detailed description of each department follows:

Limestone Preparation:

It is contemplated that the limestone quarry will be equipped with all of the modern equipment necessary to produce this raw material as cheaply as possible and to deliver it to the limestone crushing plant.

A crusher feeder has been provided to insure the maximum output from the primary crusher. The primary crusher will be of suitable size to work with the shovel dipper, and will be operated in open circuit. The primary crusher product will be conveyed on an inclined belt conveyor to a vibrating screen above the secondary crusher. This screen and the secondary crusher will be operated in closed circuit. The oversize rejected by the screen will drop into the secondary crusher, and the secondary crusher product will be deposited upon the first belt by a second inclined belt conveyor for rescreening.

The vibrating screen will be equipped with a fine screen cloth to insure that all finished product will be suitable for grinding mill feed, which is about ½ in. and finer. This finished crushed limestone will be conveyed on a third inclined and horizontal belt conveyor to the top of a bedding or blending pile where it will be deposited in thin layers along the length of any section of the pile by means of a self-propelled, reversing, travelling belt conveyor tripper. Normally the limestone high in calcium carbonate content will be spread over one section of the pile and the low calcium carbonate limestone in a separate section.

Underneath the length of the bedding pile is a tunnel in which are located a battery of specially designed disc feeders spaced on centers of about eight feet. These feeders simultaneously withdraw the crushed limestone from the entire length of each section of the bedding pile. This operation results in the elimination of extreme variations in the chemical composition of the limestone in each section of the bedding pile which may be caused by variations in the quarry limestone deposit.

By regulating the rate of feed to each disc feeder the chemist may accurately control the lime content of his mix at this point. All of the disc feeders discharge onto a fourth horizontal and inclined belt conveyor which deposits the blended crushed limestone into the grinding mill limestone feed bin or into the reserve limestone storage area of the bulk material storage structure where it will be handled thereafter by the crane.

Separate receiving hoppers, crushers, and belt conveying equipment have been provided for handling the other necessary raw materials or coal required for the operation of the plant and will deposit these materials into the allotted storage areas for such materials in the bulk material storage structure. This bulk material storage structure is served by an overhead travelling crane equipped with a clam shell bucket of suitable size. This crane will handle all bulk materials not pulverized. The entire structure will be covered by a roof and should be completely enclosed on the sides, and be ventilated.

The bulk material storage structure provides ample space in a central location for storing and blending and handling adequate reserve stocks of each raw material required for the operation of the plant. This insures the uninterrupted operation of the plant in spite of bad weather or delays in the delivery of any of the raw materials to the plant.

Raw Material Grinding:

In this design the raw material grinding machinery and the clinker grinding machinery is grouped in a single building built as a lean-to against the side of the bulk material storage structure. This reduces the cost of construction and allows the minimum use of operating labor.

In the bulk material storage structure, in front of each grinding mill, are a series of three raw material feed bins. These are served by the storage crane. One bin will be used for crushed limestone, one for crushed clay or shale, and one is for sand or iron if required for any type of cement. Under each bin is a feeder. Each feeder discharges directly into the feed end of the grinding mill.

The feeder speeds are automatically controlled by the controls provided on the grinding mill. These proportioning feeders may be operated singly or with one or both of the other two so that each raw material may be ground separately or in combination with others as may be desired.

In special cases in wet-process plants a clay wash mill will be necessary to properly handle certain types of wet or sticky clay. This can be added without in any way detracting from the basic plan.

The wet-process grinding mill shown will be operated in closed circuit with suitable wet classifiers in order to obtain the maximum output with the minimum power input per ton of finished material. This closed circuit operation with its greater output per KWH also reduces the capital investment for grinding mills as smaller mills will be supplied to do the same amount of work as that done by larger and more expensive grinding mills operated in open circuit. In addition the raw material fed to the kiln from a closed circuit grinding mill is better prepared for use in the kiln. This is because all of the coarse particles found in all open circuit grinding mill product has been eliminated and the extremely fine particles have also been largely eliminated. These fine particles are usually lost out of the kiln stack.

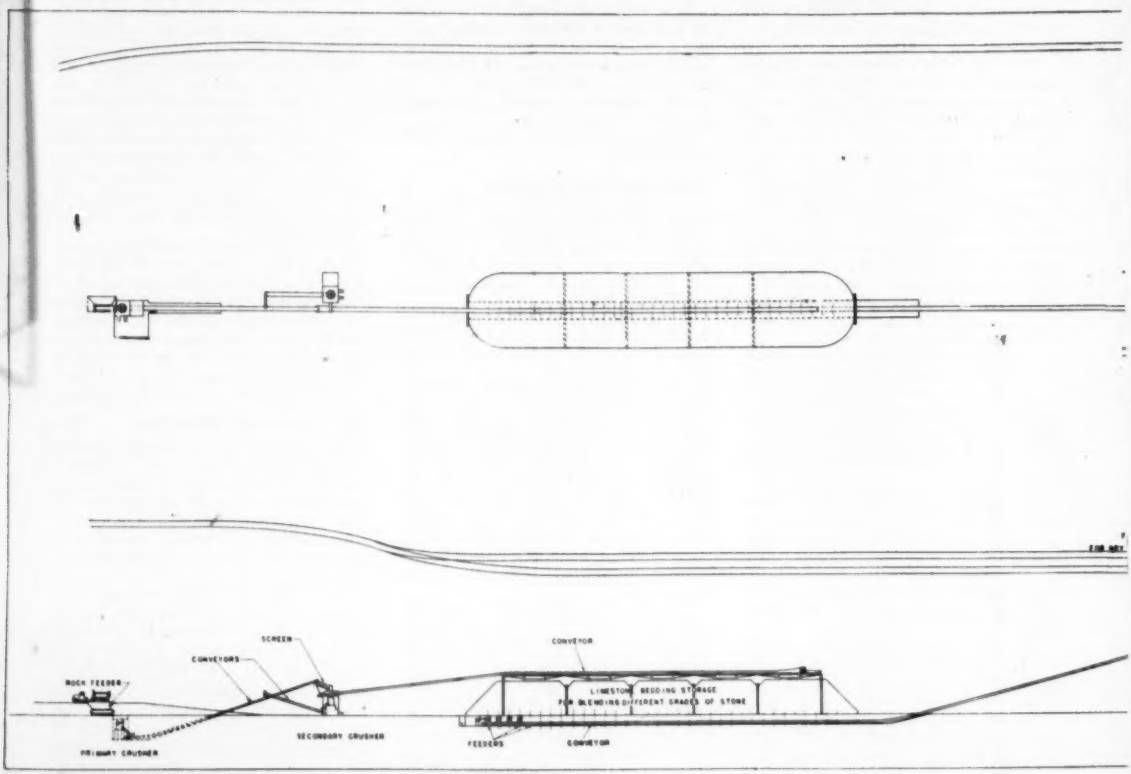
The coarse underflow from the wet classifier is returned to the feed end of the grinding mill by gravity. The fines overflow from the classifier in the form of a thin slurry which flows by gravity or is pumped to a slurry thickener where the excess water required for closed circuit grinding and close classification is recovered. The thickened slurry is then pumped to agitated slurry storage tanks where it is analyzed and then blended and pumped to the kiln slurry feed tank. The various raw materials may be stored separately, which is very desirable if many types of cement are required, or may be stored mixed as desired. The number of slurry storage tanks required is determined by the requirements of the plant in each case.

In case the plant is a dry process plant the raw material grinding mills will be operated in closed circuit with special air classifiers which will reject all oversize particles and return them to the feed end of the mill by gravity for regrinding. The grinding mill in this case will normally be of the air-swept type with oversize trunnions at each end of the mill. A suitable exhaust fan will draw air through the mill in controlled quantities and velocities. This air stream will remove the finished material from the inside of the grinding mill as rapidly as it is produced and will carry it up through the special air classifier. Only finished material is carried out of the classifier in the air stream. After leaving the classifier the finished material and the air are passed through a cyclone collector which removes most of the finished product from the air. The final cleaning of the fine dust from the air is accomplished by means of a cloth-bag-type dust collector equipped with a suitable humidity control device. The finished raw material from the cyclone and from the cloth bag collector is deposited in a surge bin over a pneumatic transport pump which moves it through a pipe line to the dry raw material storage and blending silos. In these silos it is blended by compressed air agitation, analyzed, and then pumped to the kiln feed bin as required.

Should it be necessary to dry the raw materials a separate furnace is provided to supply hot gases which are drawn into the grinding mill and which dry the fine raw material in the mill.

Burning:

Whether the plant is a wet-process or dry-process plant the prepared raw material is fed into the feed end of the kiln by means of volumetric measuring and feeding devices the speed of which is controlled by the speed of rotation of the kiln. In either case it is highly important that each revolution of the feeder delivers a constant weight of raw material in spite of changes in the water content of the slurry in the wet-process or in spite of changes in the air content of the dry raw material in the dry-process. Every facility is provided to insure that a constant weight is delivered.



The rotary kiln furnished will be of the proper diameter and length to insure the production of the desired quantity of well burned clinker with a minimum use of fuel. The dry-process kiln will normally be furnished shorter than the kilns furnished for wet-process plants as the latter require the additional length to evaporate the water in the slurry.

If operated with waste heat boilers for generating steam for power purposes the kiln lengths are reduced, but never beyond the point that will insure a well-burned clinker. Shortening the kilns results in increased fuel consumption per barrel of clinker and in a wet-process kiln it is best to install slurry filters to partially dewater the slurry when waste heat boilers are to be used. The additional fuel required in the shorter kilns is much less than the fuel required to produce the same amount of steam in a separate fuel-fired boiler so that an overall saving is the result in the cost of cement.

At the feed end of the kiln a multiple cyclone-type dust collector, an induced draft fan, and a louvre damper are supplied to reduce dust losses through the stack and to control the draft at the firing end of the kiln within very narrow limits. Provision is made for collecting the dust recovered in the kiln feed housing, the cyclone collector and from the stack and return it either to the kiln feed bin or to the raw material grinding department.

At the firing end of the kiln the finished clinker is discharged into a recuperator called a clinker cooler whose function is to recover and return to the kiln as much as possible of the heat carried out of the kiln in the clinker. An added function of this cooler is to improve the quality and grindability of the clinker by rapid cooling. The cooling is effected by passing air through the clinker bed in the cooler. After leaving the cooler the clinker is weighed and then crushed to minus-½-in. size and deposited in the clinker storage area of the bulk material storage structure.

Pulverized coal, fuel oil, and natural gas are the principal fuels used in rotary kilns. Other fuels are sometimes used when found to be suitable or cheaper. If coal is to be used Kennedy furnishes the Kennedy-Van Saun direct-fired air-swept coal drying and pulverizing tube mills, auxiliary equipment and coal burners. If fuel oil is to be used fuel oil storage tanks, heaters, meters, filters, pumps, and burners are included. If natural gas is used pressure regulators, meters, and gas burners are supplied.

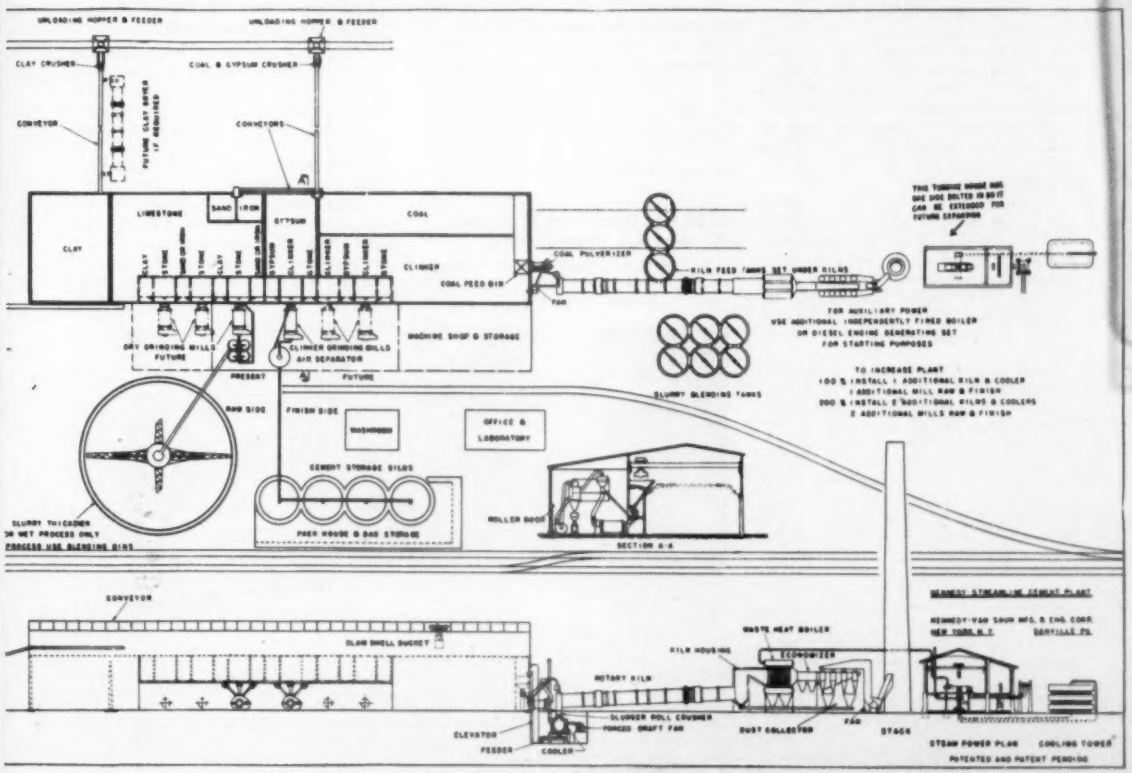
A special kiln control panel is furnished on which are mounted all of the indicating, integrating, and recording instruments needed to insure intelligent and controlled operation of the kiln as automatically as possible at all times. Proper use of the instruments will result in the maximum output of well burned clinker at the lowest possible consumption of fuel.

Clinker Grinding:

The flow sheet of this department is similar to that of the dry-process raw material grinding department. Three material feed bins are provided in the bulk material storage structure for clinker, gypsum, and limestone or other third material required for special cements. There are three proportioning feeders under the bins which discharge directly into the feed end of the grinding mill. These feeders are inter-locked so that if the feed of any one material is interrupted all feeders stop. The grinding mill is operated in closed circuit with an air classifier identical with the one on the raw mill.

One of the important benefits resulting from "air-sweeping" the clinker grinding mill is the accurate control of the temperature of the finished cement produced. With the "Air-Swept" system the internal temperature of the grinding mill is kept at any practical point desired without the use of an external water spray. This elimination of high grinding temperature will result in greater output and in improved quality, and is of particular importance in the manufacture of fine ground cements of all kinds. The low discharge temperature of the finished cement allows it to be bagged and shipped immediately without the use of external cement cooling equipment.

A pneumatic transport pump and pipe line moves the finished cement to the finished cement storage bins.



Packing:

Pneumatic transport pumps and pipe lines move the finished cement from the storage bins to the packing room. By means of a cyclone type deaerator the transport air is separated from the cement. From the cyclone the cement passes over a vibrating screen to remove any lumps or foreign material and then enters the hopper over the packing machine. This is an automatic weighing and sack-filling machine which fills the sacks to the proper weight and deposits them onto a non-smearing woven wire conveyor belt. This belt operates with other belts to deliver the filled sacks either to cars or trucks or to a sacked cement storage. A cloth bag type dust collector is connected to all dusty parts of the operation to insure a clean and dust-free department. A conveying system is provided for collecting cement spilled from the packing machine and from broken sacks.

If cloth sacks are to be used a sack sewing, cleaning, tying, and sorting department is required and furnished.

Facilities:

The buildings housing the office, laboratory, locker and sanitary equipment, shops and store room, have been combined as much as is practical to reduce initial cost. These buildings have also been strategically located.

1948 Phosphate Output Hits Record High—Value Jumps

A new high record was made in the mine production of phosphate rock in the United States in 1948, according to reports submitted by the producers to the U. S. Bureau of Mines. The total reached 9,388,160 long tons, more than a quarter of a million above the 1947 record high. Of this, 7,184,297 tons were mined in Florida, over 800,000 tons greater than in 1947; 1,499,547 tons in Tennessee, only slightly more than in 1947; and only 704,316 tons in the Western states, about half a million tons less than in the previous year.

Sales decreased sharply from 9,027,030 tons in 1947 to 8,668,769 in 1948, the increase in Florida failing to counterbalance the large decrease in the Western states. The total value of the phosphate rock sold or used rose to $50,501,598 in 1948, nearly $4,000,000 above the 1947 total. The P_2O_5 content of the domestic phosphate rock sold or used in 1948 declined from the record high of 1947 (2,903,082 tons) to 2,810,206 tons in 1948.

Imports increased both in quantity and value. Exports were less in 1948; over 600,000 tons in quantity and about $3,000,000 in value. Apparent domestic consumption increased to 7,700,081 long tons in 1948. Stocks rose sharply to 1,819,000 tons at the end of 1948, due chiefly to a large increase in those in Florida.

Total mine production of phosphate rock in the first half of 1948, according to reports of producers to the Bureau of Mines, was 4,797,764 long tons. Phosphate rock sold or used in the first half of 1948, 4,635,076 long tons, was about the same as for the corresponding period of 1947. The value, however, was over $2,000,000 greater. The average value of the phosphate rock sold or used increased 53 cents a ton from $5.17 in the first half of 1947 to $5.70 in the similar period of 1948, increases being reported in all classes of rock except Florida hard rock phosphate and Idaho rock. Total stocks in producers' hands on June 30, 1948, were nearly 300,000 tons greater than at the end of the first six months of 1947, increases being reported in Florida, Tennessee, and the Western states.

In the first half of 1948, phosphate rock was mined in Florida, Tennessee, Idaho, Montana and Wyoming. Florida is the leading shipper as usual, its marketed production being in this period more than five times its nearest competitor, Tennessee. Shipments of Florida land pebble increased considerably, but those of both soft rock and hard rock declined. The average values of the shipments of land pebble and soft rock showed marked increases, but there was a decrease in that of the hard rock. The total value of the shipments of land pebble phosphate rock increased; the total values of soft rock and of hard rock were lower than in 1947. The quantity of Tennessee phosphate rock sold or used in the first half of 1948 was 100,000 tons less than in 1947, and the value was over $100,000 lower than in the first six months of 1947. The quantity of Idaho phosphate rock sold or used in the first six months of 1948 showed a great decrease from that of the January-to-June period of 1947. Wyoming production was larger in 1948, but Montana shipments fell off markedly in the first six months of 1948.

$220,000,000 Road Program Planned for Pennsylvania

Pennsylvania, which already claims to be the No. 1 road-building state in the nation, is now launching the greatest two-year highway construction program in its history. A report submitted to Governor James H. Duff by State Secretary of Highways Ray F. Smock revealed that with the 1-cent increase in the state gasoline tax, which became effective June 1, plus establishment of the new State Highway and Bridge Authority with bond-issuing powers, it will be possible to proceed with a $220,000,000 construction schedule during 1949-51.

Mr. Smock stated that in the 1947-49 fiscal period Pennsylvania expenditures for construction, reconstruction, resurfacing and widening reached an all-time high of $184,774,000, and that no other state approached either the construction or maintenance records of Pennsylvania in the last two years. He added that studied consideration is given to all projects and importance of each.

With the gasoline tax increase, which raised the total state gas tax rate to 5 cents a gallon, $90,000,000 a year will be available for construction, Mr. Smock explained. The State Highway and Bridge Authority will be able to finance projects amounting to an additional $40,000,000 in the next two years, he added. Of the road funds to be spent by Pennsylvania in the current two-year period, the federal government will contribute about $20,000,000.

American Road Builders' Assn. To Meet in Cincinnati

Cincinnati has been chosen for the 47th annual meeting of the American Road Builders' Association next March 6-9, according to an announcement made by Charles M. Upham, engineer-director of A.R.B.A. The four-day session will be held in Cincinnati's Netherlands Plaza Hotel.

There will also be meetings of the board of directors of the A.R.B.A., and the boards of its several divisions, as well as gatherings of county highway officials, airport, highway contractors, municipal, and manufacturers.

• At the North American Cement Company's plant at Security, Md., a diesel-electric unit took over the work of a steam locomotive last year. Since the first day, this G-E 45-ton unit has been putting in a 104-hr. week regularly, hauling as many as 75 loaded cars per day. During the 8-hr. day it switches cars loaded with cement and brings in coal and shale. At night and on Sundays it hauls limestone from the quarry to the plant. Although it is 50 percent heavier than the steamer it replaced, the unit reportedly costs only about half as much in fuel and maintenance.

• Overall view of Bee Rock Quarry, on the Little Red River near Searcy in White County, Ark. Modern machinery was installed and operations resumed to produce less expensive road material from the sand-stone, and speed modernization of local roads. Here, a truck backs toward the primary crusher with a load of rock (right center), while another approaches the shovel (lower left) for a load. At top center, a truck filled with crushed stone heads out of the quarry, as two empty trucks come in.

Reopen Historic Bee Rock Quarry

TO eliminate the cost of hauling crushed stone at least 60 miles from the nearest commercial stone plant, officials of White County, Ark., reopened the Bee Rock Quarry on the Little Red River near Searcy in May of 1948. Now under county management, this historic 19th century quarry once supplied building block of the "Bee" rock to Memphis, Tenn. It had been idle from the late 1860's to last May, except for a brief period during World War I, when it was operated by the government.

Under county operation, the quarry produced 24,000 cu. yds. of crushed stone from May through December of 1948, an average of 170 cu. yds. per day. This was well below the rate originally anticipated, due largely to the fact that the sandstone proved very hard. It had to be fed to the crusher in large pieces, some almost man-size, which caused difficulty in handling and slowed crushing. By December, however, the operators worked out methods of handling the stone more efficiently, increasing the production average to between 300 and 400 cu. yds. of 1½-in. stone per eight-hour day.

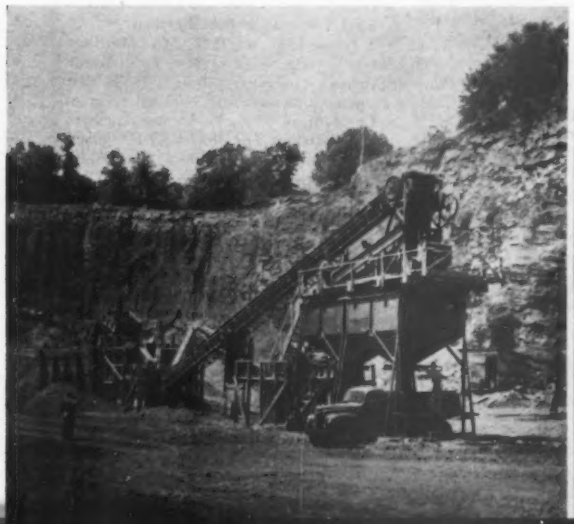
Blast holes are drilled to a depth of 130 ft. After shooting, a bull-dozer piles the stone for the ¾-cu. yd. shovel.

Two 4-cu. yd. dump trucks haul the rock to a hopper built over a 3- by 10-ft. Pioneer apron feeder regulated through a clutch control. The stone is reduced in a 20- by 36-in. jaw crusher set at a 3-in. opening. Both the primary unit and the feeder are pulled by a 100-hp. International UD-18 diesel engine.

From the jaw crusher, the stone drops onto a 30-in. by 90-ft. belt conveyor and is carried to a vibrating screen. Only one deck is used. Minus-1½-in. stone drops directly into the steel storage bin; oversize is chuted to a 40- by 22-in. Pioneer roll crusher.

It is then carried on a short belt conveyor to a transfer chute and routed back on the main belt for return to the vibrating screen. The roll crusher is powered with a 125-hp. International UD-18A diesel engine which also drives the short belt conveyor.

• The crushing and screening plant, showing the entire sequence of operations from the truck feeding the primary crusher hopper (left) to the second truck loading from beneath a steel storage bin.



• Close-up of the steel storage bin, the feed-end of the 90-ft. belt conveyor, the vibrating screen, the roll crusher, and the diesel which drives both roll crusher and return belt conveyor.

personal mention

A. E. Pavlish

ARNOLD E. PAVLISH has been appointed technical director of the Kelley Island Lime and Transport Company, Cleveland, O., to succeed the late Russell G. Greeves.

Mr. Pavlish comes to Kelly Island from Battelle Institute, Columbus, O., where he has conducted and supervised research in chemical technology for 14 years. He is active in the work of the Electrochemical Society, the American Ceramic Society, the American Society for Testing Materials, and the American Chemical Society. He is a graduate of Ohio State University.

HERBERT H. LAUER, plant manager of the Glens Falls Portland Cement Company, Glens Falls, N. Y., for the last 6½ years, has resigned from this position, effective September 30, to enter the field of consulting engineer. His headquarters are in Philadelphia.

Mr. Lauer has had more than 30 years of experience in the design, construction, operation and management of cement and other industrial plants. He designed and supervised the construction of the Waco, Tex., plant of the Universal Atlas Cement Company and the firm's facilities at San Juan, Puerto Rico, as well as numerous installations at other Atlas plants, mines and quarries. He was formerly superintendent of the Green Bag Cement Company's plant at Neville Island, Pittsburgh, Pa. Other positions as plant engineer took him to Alabama, Tennessee, West Virginia, Illinois and Mexico. He is a graduate engineer (Lehigh University Mining Engineering School) and a member of the American Society of Mechanical Engineers, A.I.M.E., and the New York State Society of Professional Engineers.

The following Colorado School of Mines alumni were recently awarded distinguished achievement medals for outstanding accomplishment in the field of minerals engineering: GENERAL DALE D. HINMAN, U.S. Army (retired); H. C. PRICE, H. C. Price Company; JOHN F. MYERS, Tennessee Copper Company; RUSSELL B. PAUL, consulting engineer; DR. EDMOND C. VAN DIEST, consulting engineer (retired); ANDREW WEISS, Mexican National Irrigation Commission (retired); DR. JAMES BOYD, director, U.S. Bureau of Mines; OTTO HERRES, Combined Metals Reduction Company; JAMES ASHLEY CLARK, Standard Oil Company; BLAIR BURWELL, consulting engineer; CARL E. LESHER, Disco Company; C. Q. SCHLERETH, mining and metallurgical engineer.

O. E. JACK, chief chemist of the Permanente Cement Company, was the principal speaker at the technical session of the A.I.M.E. (San Francisco section) held at the San Francisco Engineers Club on September 14. Mr. Jack's topic was *Production of Cement by the Permanente Cement Company*. A color sound film was shown in connection with the address.

Four appointments have been announced by officials of the Southwestern Portland Cement Company of Los Angeles.

GEORGE E. WARREN was elected president of the firm on July 12. MAX A. KOFFMAN was named vice-president and treasurer; THEODORE K. PARTRIDGE, vice-president in charge of sales and traffic; and ROBERT H. FIELDING, secretary. The last three appointments were made on August 15.

Mr. Warren was previously vice-president in charge of Southwestern's operation at Osborn, O. He has been with the firm since 1934. In earlier years he was an official of the Portland Cement Association, with offices in Chicago.

Mr. Koffman has been associated with Southwestern since its founding and has served for many years as secretary-treasurer. Mr. Partridge was formerly general sales manager for Los Angeles. Mr. Fielding formerly served as assistant secretary.

WILLIAM DALE WADLINGTON of Chico, Calif., was recently appointed a sales representative for the Calaveras Cement Company in the North Sacramento Valley territory. His headquarters will be in Chico.

The election of GORDON TONGUE as vice-president and general manager of the Northwestern Portland Cement Company, Seattle, Wash., was announced recently by C. T. W. Hollister, president.

Mr. Tongue has a long record in the cement industry in the Pacific Northwest. He was associated with Superior Portland Cement, Inc., from 1913 to 1946, when he took a position in Los Angeles. He returned to Seattle on January 1, 1947, to become vice-president of the Pacific Coast Cement Company. When that company's Seattle plant was leased to Permanente Cement Company early in 1947, Mr. Tongue remained as division manager of operations.

Mr. Tongue has been vice-president of the Federated Industries of Washington and active in the Seattle Chamber of Commerce.

H. W. BRISTOL, district sales manager for the Lehigh Portland Cement Company in Minneapolis, Minn., has retired from his duties after 34 years of service with this firm.

M. F. RING, formerly on the sales force in the Minneapolis-St. Paul area, who has been with Lehigh since 1914, succeeds Mr. Bristol as district sales manager.

W. A. BUGGE was recently named director of highways for the state of Washington. The appointment was effective as of July 1.

FRANK C. BOLWAHNN, division representative for the Medusa Portland Cement Company at Chicago, was recently appointed general chairman of the industrial division for the Family Service Association at Glen Ellyn, Ill.

The following were recently elected officers of the Canada Cement Company, Ltd., Montreal, Canada:

G. A. RUSSELL, formerly secretary-treasurer and director, vice-president; W. O. BOVARD, formerly vice-president of sales, director and vice-president and director of sales; J. NARSTED, former general operating manager, vice-president in charge of production.

DAVID G. STENBERG has been appointed head of the Chicago district sales office of the National Gypsum Company. He will direct and supervise sales in Illinois, a portion of Wisconsin, Iowa, Indiana and Michigan.

Appointment of PATRICK F. MORRISSEY as sales manager, New York, effective July 16, was announced by Albert O. Stark, vice-president of the Universal Atlas Cement Company, a United States Steel Corporation Subsidiary.

From 1932 to 1938 Mr. Morrissey was a salesman for Best Bros. Keene Cement Company, Chicago. When that company merged with National Gypsum Company in 1938, he became salesman in the Dallas, Tex., territory. He joined Universal Atlas in 1939 as Atlas White Cement representative in Kansas City. In 1944 he joined the U. S. Navy and after two years of active duty in the Pacific area was honorably discharged as lieutenant (j.g.).

Mr. Morrissey returned to Universal Atlas as Atlas White Cement representative in Kansas City in 1946. In 1947 he was appointed district sales manager of the Des Moines district, which position he has held until the present appointment.

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EDWARD J. HEAD was recently named vice-president in charge of sales for the Metropolitan Sand and Gravel Corporation of Port Washington, N. Y. Mr. Head was formerly New York sales manager for the Universal Atlas Cement Company.

At the same time HOWARD E. MARSH was promoted to the post of vice-president in charge of plant operation.

ROBERT L. CORNISH has been appointed advertising and sales promotion manager of the Building Products Division, Great Lakes Carbon Corporation, as announced by T. C. Carter, vice-president. Mr. Cornish will be responsible for all advertising, sales promotion and publicity of the products of the division. These include rock wool home insulation and a lightweight aggregate for plaster and cement sold under the tradename of "Permalite." Mr. Cornish was previously in the sales promotion department of Johns-Manville and prior to that was in the general publicity department of Union Carbide and Carbon Corporation. He will be located in the executive offices of the corporation in New York.

HARRY E. LEWIS was recently appointed manager of the products engineering department of the Building Products Division of Great Lakes Carbon Corporation. He will have complete charge of supervising the improvement and development of all the products of the division, and will co-ordinate the gathering of all technical information on the division's products.

Mr. Lewis has had over 16 years experience in the field of insulation, heating and refrigeration. He is a registered mechanical engineer and is an active member of the American Society of Heating & Ventilating Engineers, the American Society for Testing Materials, and the American Society of Refrigerating Engineers.

The following appointments have been announced by the Lone Star Cement Corporation:

WALTER F. LAW has been named vice-president and manager of the Alabama Division, succeding the late Charles E. Fontaine. RALPH R. RILEY was appointed assistant manager; and B. L. WYMAN JR. was promoted to succeed Mr. Riley. These appointments took effect on July 15, 1949.

MELVIN H. BAKER, president of the National Gypsum Company of Buffalo, has been elected to the board of directors of the Safety Council of western New York.

Newly-elected members of the North American Cement Company's board of directors are FRANCIS B. CUMMINGS, secretary and controller, and ROY S. ADKINS, vice-president in charge of sales.

GUY GEORGE GABRIELSON, new Republican national chairman, is the president of the Nicolet Asbestos, Mines, Ltd., Norbestos, Que., Canada.

obituaries

C. C. MERRILL, vice-president and general manager of the Southwestern Portland Cement Company, Los Angeles, Calif., died on August 5 at his home in Los Angeles after an extended illness. He was 74 years of age.

Mr. Merrill had been with the cement firm since its organization by Carl Leonardt, and vice-president since 1907.

WINFIELD H. MCDOWELL, 65, who was Kansas City division sales manager for the Universal Atlas Cement Company until his retirement a year ago, died on July 12 at a hospital in Kansas City, Mo. He had been with Universal Atlas for the last 40 years.

JAMES E. POTTER, who was for the last 29 years general superintendent of the Tennessee Sand and Gravel Company at Sheffield, Ala., died on July 10 at a hospital in Florence, Ala. Mr. Potter, who was 64 years of age, assisted in the construction of the Wilson Dam.

WALTER M. ARMSTRONG, 80, retired president of the Standard Sand & Gravel Company of Wheeling, W. Va., died on July 5 at his home in Wheeling. He had retired from active business life 20 years ago.

LESLIE SHARP, an employee at the Ideal Cement Company's plant at Trident, Mont., sustained fatal injuries on June 27 when he became entangled in machinery at the plant. He died while being removed to a hospital.

CARTER E. BIEWER, 52, vice-president of the Western Sand Gravel Company, Spring Valley, Ill., died on July 15 in a hospital at Galesburg, Ill., as the result of injuries received in an automobile accident on June 20.

ERNEST E. GLENN, 38, vice-president and treasurer of Tobin Quarries, Inc., Kansas City, Mo., died on June 19 at his home.

Mr. Glenn had been in ill health for some time. He had been with the Tobin company for ten years.

JOSEPH H. VONDER HAAR, president of the Vonder Haar Sand & Gravel Company, St. Louis, Mo., died at a hospital in that city on August 19. He was 59 years of age.

Mr. Vonder Haar founded the sand and gravel business in 1929 with his brother, who died in 1932. He had been ill with a heart ailment for the last two years.

WALTER HULL, a maintenance man for the Canada Cement Company at Point Anne, Ont., Canada, was electrocuted on July 26 when he came in contact with a power conductor on an overhead traveling crane. He was 38 years of age.

NELSON MONEYPENNY, retired president of the Alberene Stone Company of New York and Schuyler, Va., died on July 31 at the home of his son, James A. Moneypenny in Ridgewood, N. J. He was 83 years of age.

ANDREW M. HARNWELL, 82, secretary-treasurer and a director of Consolidated Sand & Gravel, Toronto, Canada, died suddenly. A resident of Toronto for many years, Mr. Harnwell had been a director of several other firms, including Gachin Holdings and Standard Paving.

HOWARD C. WILLIAMS, 73, died recently in a hospital at Easton, Pa. He was formerly a technician for the Alpha Portland Cement Company and the Canister Company of Phillipsburg, N. J.

PAUL J. ESSICK JR., chief of the Philadelphia Bureau of Highways, died recently at his home in that city. He had been a member of the Bureau since 1912. Mr. Essick was 60 years of age.

ABRAM VAN AUKEN FELTEN, vice-president of the New England Lime Company, Adams, Mass., died at Westport, Conn., on August 17. Mr. Felten was 83 years of age.

A. F. PIERCE, a salesman for the Consolidated Cement Company at Fredonia, Kan., died on July 27 in Kansas City, Kan., after suffering a heart attack. Mr. Pierce, well known for his work in youth circles, became ill while attending a model airplane show in Olathe, Kan.

MASON C. MCNARY, a field representative of the Portland Cement Association, died on August 10 at his home in Crafton, Pa., at the age of 61 years.

GEORGE P. TUNNELL, 82, who operated the Lewes Sand Company of Lewes, Del., for many years, died on August 12 after an illness of one week. Mr. Tunnell sold the sand business two years ago, having been actively engaged in its operation until that time.

new machinery and supplies

PIT AND QUARRY

● Half-Yard Shovel

The Model LS-51, newest addition to the Link-Belt Speeder line of shovel-cranes, is equipped with "Speed-o-Matic" full hydraulic controls. First introduced in 1936, Speed-o-Matic controls have until now been available only on machines of 1½- to 3-cu. yd. capacity. It reportedly provides faster operation, greater output and lower maintenance cost.

The LS-51 is fully convertible for operation as a shovel, trench hoe, lifting crane, dragline, clamshell or pile driver. Changing from one attachment to another is quickly accomplished with only slight changes in the machinery. The front drum lagging used in dragline and other cable operations is interchangeable with a split sprocket used in connection with the independent positive chain crowd on shovel operations.

The independent rapid boom hoist provides hoisting and lowering of the boom under power of the engine.

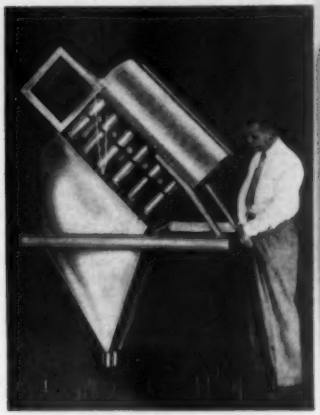
For balanced rotation without slippage or uneven wear, the LS-51 shovel-crane has hook-type conical rotating rollers, individually mounted, bronze-bushed and adjustable, traveling in a roller path 53 in. in diameter and providing unusual stability. Maintenance on the LS-51 is materially simplified by interchangeability of such parts as front and rear drum clutches, the boom hoist clutch, and the swing and travel clutches.

● Miniature Dust Collector

The Dustex Corporation, 1758 Walden Avenue, N.Y., offers its "Microclone" miniature cyclone dust collector, available for single- or double-bank arrangement. The device can be furnished in a complete range of sizes, from 200 to 100,000 c.f.m. and more.

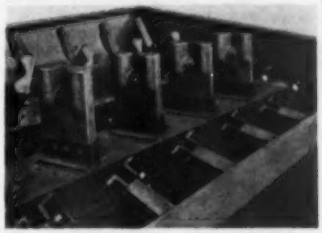
Cited as desirable features by the manufacturer are high collection efficiency, low maintenance and operating costs, and safety. According to Dustex spokesmen, the internal air passages are so designed that no dust buildup or plugging occurs. It is claimed that collection efficiency has in some instances been higher than that obtainable with wet or filter types of collectors, yet with the low maintenance index of the cyclone type. Because the Microclone is a dry collector and contains no filters, it is pointed out, the device gives uninterrupted service without attention.

Construction is of ¼-in. abrasion-resistant cast aluminum, with housings and hoppers of heavy-gauge galvanized steel. The aluminum precipitating section will not strike a spark from steel objects

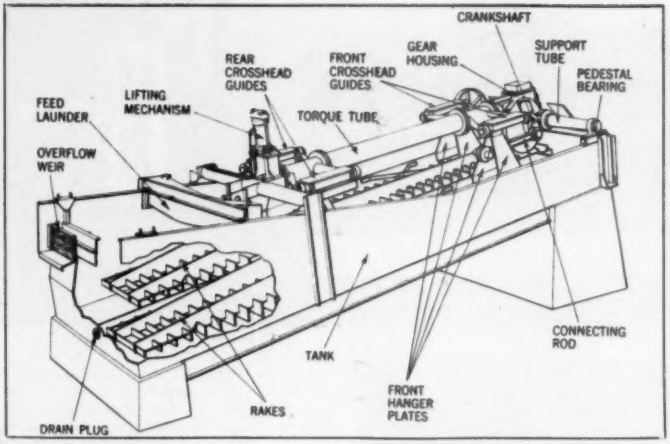


which might enter the air stream.

Its compact design makes possible a considerable saving of space. Microclone collectors are often installed inside, where other types would have had to be located outside.



This view shows the corrugated paddle shoes on an Eagle log washer, made by the Eagle Iron Works, Des Moines, Ia. According to the manufacturer, the corrugated wearing surfaces afford a scrubbing action which abrades stone against stone. A column of water rising continuously from the bottom of the tub floats out loosened impurities, and thus two-way cleansing action is achieved. The shoes are cast chilled semi-steel, bolted to steel feet which are welded tangentially to the box section shaft.



● Rake Classifier

The Dorr Company has announced a new and distinctly different Dorr Classifier, known as the Type H, which incorporates a radically different head motion design and rake path and represents, it is said, a major step forward in mechanical refinements. Offered for general classification work, it is reported to offer many definite advantages over its predecessor, the Dorr Type F, which it now supplants in all sizes and types except the light-duty and laboratory size units.

The rakes, tank, feed launder and general tank arrangement of the Type H classifier are essentially the same as those of its predecessor, the Type F. It is in the mechanical design of the headmotion and drive mechanism that it differs from any other classifier yet produced.

The Type H mechanism may be divided into three basic subassemblies: (1) the torque tube, rocker arm and crosshead slide assembly; (2) the drive, gear and headmotion assembly; and (3) the lifting mechanism assembly. The torque tube, rocker arm and crosshead slide provide the linkage between the headmotion assembly at the discharge end of the machine and the lifting mechanism assembly located near the overflow end.

The entire mechanism is supported at only three points. At the discharge end it is carried by the support tube which spans the tank and rests on two pedestal bearings. A support shaft and bearing attached to the hydraulic lifting device by a hanger rod provides the third point of support near the overflow end.

The Type H mechanism may be driven by a constant or variable speed drive, connected by conventional V-belts to a pinion shaft. Integral with this pinion shaft are two helical pinions of opposite hand which drive the gears and crank shafts. Each crank drives a connecting rod, which, in turn, drives the rakes forward and backward.

The rake path is that of a rectangle with rounded corners, with the raking and return strokes flat and the raising and lowering strokes forming an ellipse. This motion is entirely harmonic, with the result that the rakes are in balance both horizontally and vertically at all times.

The hydraulic lifting device is located near the overflow end of the tank. It is operated by a small motor-driven pump with electrical pushbutton control.

In the Type H lubrication system the main bearings are of the anti-friction type, automatically lubricated where feasible. Once-per-shift lubrication is required at one easily accessible point, and there are only nine points which require lubrication every one to two months. An automatic recirculating, filtered oil system lubricates the fully-enclosed crosshead slides, and flushes them out to prevent the accumulation of abrasive dust. The gear housing requires normal oil-level maintenance.

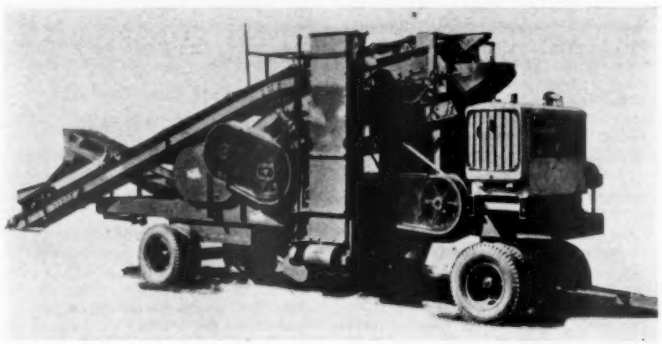
● Check Valves

The Darling horizontal swing check valve is ideal for mine and quarry service because of its large, streamlined, straight-through flow area which minimizes pressure drop and abrasive wear.

The disc is so supported as to provide a slight initial pressure against the seat. A few ounces of pressure on the pump side of the valve will immediately unseat the disc; yet the valve remains tight when there is no differential in pressure on either side of the disc. In closing, the top of the disc seats first, and the bottom follows.

When the valve is open, the disc is entirely out of the line of flow, reducing friction to the minimum. This fully-revolving disc feature permits seating in a different position each time the valve is operated, thus distributing the wear uniformly over the entire seating surface. The hinge pin, held entirely

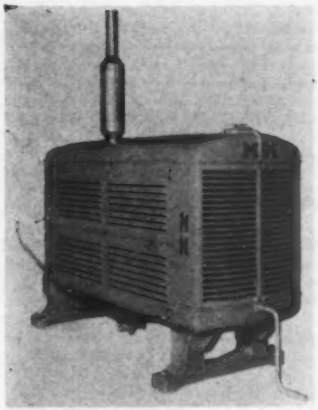
by the rubber-covered bonnet arm, does not extend through the body of the valve. The complete gate assembly is suspended from the bonnet arm, and can be lifted out of the body of the valve in one unit by merely unbolting the bonnet. The seat ring, screwed into the hard rubber lining of the body, can be removed and replaced without removing the valve from the line. Manufactured by the American Hard Rubber Co., 11 Mercer Street, New York, N. Y.



A completely new small gravel crushing and screening plant was recently added to the line of portable duplex plants manufactured by Pioneer Engineering Works, Inc., Minneapolis, Minn.

Designated as the 17-V, this plant incorporates all features of the larger "bottom deck feed" plants. New features include a swivel-type feeder conveyor, 12 ft. 6 in. overall height; all drives on plant proper are either V-belt or tumbler shaft and gear box. The delivery conveyor folds at the side.

The jaw crusher is 10 by 16 and the roll crusher 24 by 16. A 30 in. by 8 ft., 3½-deck vibrator screen provides 40 sq. ft. of effective screening area. The chassis is two axle, with four 9:00 by 20 tires front and rear.

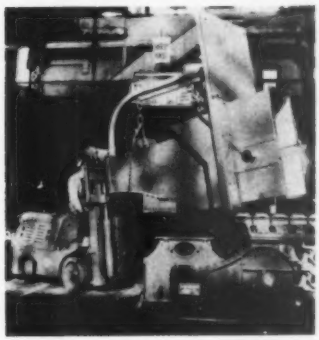


This new industrial power unit, Model 425-6A, has completed Minneapolis-Moline Company's line of equipment for all hp. requirements. The approximate weight of this unit with radiator and enclosure is 2500 lbs. It has removable cylinder heads and blocks and valve-in-head design for easy servicing. The unit pictured here has a 6 cylinders, with a piston displacement of 425.5 cu. in. It burns gasoline, distillate, natural gas or LP gas fuel.

● Lifting Boom for Fork Truck

A lifting boom for handling engines, long bars, bulky and odd-shaped material has been added to the line of accessories available for The Buda Company's 5000-lb.-capacity at 20-in. load center Model F-50 fork truck. In addition to carrying material, the Model F-50 lifting boom easily reaches over machinery and stored material for lifting operations.

The lifting boom is readily interchanged with the forks and attached to



the carriage in the same manner. The swivel hook can be positioned in any of the six positions on the lifting boom for carrying various loads or used with another swivel hook, as illustrated, for lifting bulky equipment. The Buda Company, Harvey, Ill.

● Safety Spectacles

A new safety spectacle has been developed under the trade name "Saf-I-Spec" which has a one-piece replaceable adjustable lens. Patented, quick detachable temples may be instantly attached to the outside edge of the lens, making it possible for the wearer to adjust the temples to the proper, comfortable position. The lens has an integral molded sweat-bar and patented design which is said to give unusual rigidity and still maintain alignment. This safety spectacle can also be adjusted to wear over personal glasses.

The one-piece lens is made from "Optilite," a new optical safety plastic which meets strict government specifica-

tions for impact and piercing resistance.

The lenses are optically correct and are available in crystal clear or antiglare green. The detachable temples are permanent equipment and can be refitted over and over again to replacement lenses. The Saf-I-Spec is extremely light and reportedly offers maximum protection from all impact hazards. Manufactured by the United States Safety Service Company, Kansas City 6, Mo.

● Starter

A new wall-mounted, full-voltage starter—the Type 371—especially adaptable for industries in which dust laden atmospheres are present, has been announced by Allis-Chalmers Mfg. Co., Milwaukee, Wis.

The new started has its entire mechanism immersed in oil and sealed from the atmosphere. It is weatherproof and can be used for outdoor installations. The starter enclosure is entirely corrosion-resistant; the head casting is of aluminum alloy, all exposed hardware is stainless steel, and the steel tank is coated with aluminum paint on the outside and marine spar varnish within.

Built for simple installation and easy inspection, the starter controls squirrel cage motors and the primary of wound rotor motors of 350 horsepower or less at 2300 volts. It is actuated by a pilot device, such as push buttons, float, pressure switches, or similar devices.

Either undervoltage protection or release may be incorporated in the control circuits used in conjunction with the starter. A built-in drum type multi-stage auxiliary switch provides for extra circuits when desired in the control system.

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Brake Shoe

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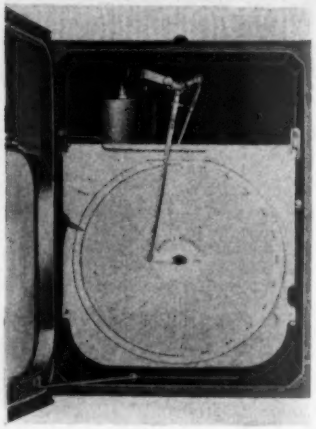
Offices in Principal Cities

● Absolute Pressure Gauge

The Bristol Company, Waterbury 91, Conn., announces the development of a mechanical-type recording absolute pressure gauge based on an entirely new principle, involving a pressure-sealed lever arm so constructed that it is frictionless, entirely free from lost motion, and free of turning moments due to changes in differential pressure across it. This design makes possible the recording of extremely low absolute pressure ranges.

Known as the Series 500 Recording



Absolute Pressure Gauge, the new instrument is offered in ranges from 0 to 20 millimeters mercury up. Several instruments with the extremely low range of 0 to 6 millimeters mercury absolute pressure have been successfully used.

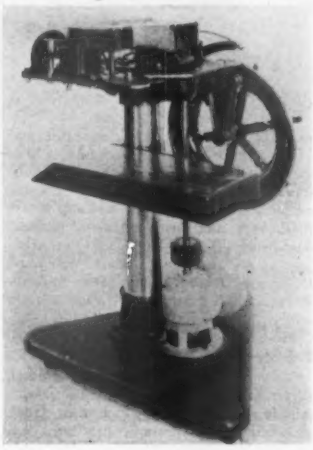
The instrument is rugged in construction and can be used under ordinary plant conditions. It gives an accurate record of vacuum in trems of absolute pressure, inherently corect for barometric variations. It is offered as a recorder, as an automatic controller, and for remote measurement and automatic control of absolute pressure.

A new combination tagline winder and dipper trip developed by the Norin Manufacturing Co., Inc., West Springfield, Mass. Known as "TagMaster", this unit permits adjustment of the tagline pull to suit any job. It is said to permit accurate loading without moving the boom and accurate casting without moving the boom or machine. A simple adjustment converts the tagline to a dipper trip for use with a shovel front.

● Bag Closer

A new portable, semi-automatic model of the Minneapolis Bag Closing Machine that will close paper bags of capacities from 5 to 25 lbs. at speeds up to 1200 per hour has recently been announced by D.& H. Machine Works, Minneapolis, Minn.

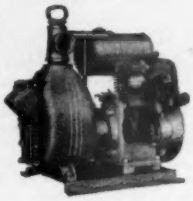
The conveyor feature of other models has been eliminated on the Model PA,



making it semi-automatic. The closing mechanism is mounted rigidly and the table is adjustable to the height of the sack. The filled sack is placed on the table and moved into the closing head which automatically gathers the sack neck, crimps and compresses it tightly, and fastens it with a galvanized steel wire ring.

● Self-Priming Pump

Sterling Machinery Corp., Kansas City, Mo., has developed a high-head self-priming pump that is a heavy-duty unit, capable of pumping large capacities as well as against high heads.

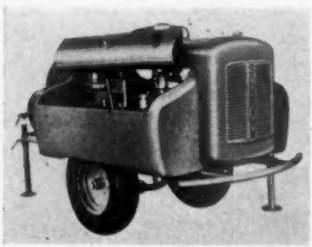


This new pump is especially well adapted for use by mines, quarries, municipalities, public utilities, oil companies, industrial plants, farmers and many others. It is suitable for a very wide range of service, such as emergency fire protection; repairs to gas, sewer and water mains; pumping out barges; washing boilers and tanks; pumping through long pipelines and to high levels and against comparatively high pressures.

This new pump was exhibited for the first time at the Public Works Congress and Equipment Show in Kansas City, September 18 to 21.

● 105-Cubic Foot Compressor

The latest development in compressor design offered by Schramm Inc., West Chester, Pa., is the 105 "Unistage." Among the features of this unit is the fact that the 4-cylinder engine and the 4-cylinder compressor which it operates complement each other, with 90 percent of the engine parts interchangeable. This



fact reduces the carrying of service parts to the minimum.

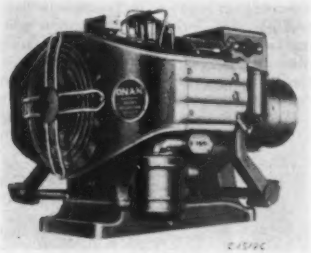
With an actual air delivery of 105 cu. ft., this unit is also equipped with the Schramm "Pneumastat", designed to assure infinitely variable speeds and the elimination of continuous loading and unloading. The simplified design has resulted in a rugged outfit capable of 24 hours' continuous service and the elimination of two-staging and intercoolers.

● The powerful 140-drawbar hp. International TD-24, shown here handling a large scraper, is the first diesel crawler tractor to be equipped with a hydraulically controlled planetary gear train. Through "planet power," the TD-24 gains unexcelled maneuverability and instant shifting over a high-low speed range in any of its four gears forward and reverse, giving it a total of eight speeds forward or reverse.

● Air-Cooled Plant

A radically-new 5,000-watt a.-c. diesel electric plant has been announced by D. W. Onan & Sons Inc., Minneapolis, Minn. The Model 5DRP is said to combine unusually smooth operation and compact design, producing surprisingly low-cost electric power.

Its prime mover—a new Onan-designed, opposed-two-cylinder, air-cooled diesel engine reportedly runs so smoothly that it requires no bolting down, no special base. Integral shock mountings make it possible to operate this unit right on the floor. Dimensions of the plant emphasize its compact design: length, 38¾ in.; width, 30¼ in.; height, 26⅛ in.



The 5DRP is available in 60- or 50-cycle and in all standard voltages.

Longer engine life is obtained by the extra-large bearing surfaces and forced pressure lubrication; greater economy and convenience are assured by compression starting and running on inexpensive diesel or domestic fuel oils.

All 5DRP models are electrically cranked from a start-stop switch control located on the plant. Remote-control stations can be installed within 250 feet of the unit.

Standard equipment on all 5,000-watt Onan diesel electric plants includes the following items; two 6-volt heavy-duty starting batteries, battery cables, hydrometer, mounting rubbers, 5-gal. fuel tank, 2 flexible fuel lines, muffler, 2 large oil bath air cleaners, primary and secondary fuel filters, 2 air heaters, one remote station and instruction book.

● New Line of Pillow Blocks

To round out its extensive line of anti-friction bearing industrial units, The Fafnir Bearing Company of New Britain, Conn., announces the development of a series of normal and heavy-duty spherical roller bearing pillow blocks. Spherical roller bearings for these units will be manufactured by The Torington Company, Torrington, Conn.

Fafnir spherical roller bearing pillow blocks will be available in bore sizes ranging from 2 7/16 in. to approximately 8 in. They will be self-aligning, incorporating either felt or triple metallic labyrinth seals, and units will be built for either straight-shaft or adapter-type mounting.

The new line will be marketed through the same channels of distribution as are Fafnir ball bearings and ball bearing pillow blocks.

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Extremely hard, right to the core, Moly-Cop Grinding Balls retain their spherical shape longer under the most severe conditions, giving you more tons per mill hour, at a lower cost per ton of production. Note the structural comparison of fractured Moly-Cop and Regular Carbon balls at the left.

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● Heavy-Media Separation

Southwestern Engineering Co., Los Angeles, Calif., has developed a factory-built heavy media separation plant which is being pre-fabricated in the company's factory in Los Angeles from a SWECO design that has introduced new heavy-media separation features and simplified field erection.

The process employed in the new plants, which are being made in 100 t.p.h. and smaller sizes, is that licensed by the American Zinc, Lead and Smelting Company, for which American Cyanamid Company is the exclusive technical and sales agency.

The SWECO plants are using field proven standard equipment. The separatory vessel selected for the plants is the Akins separator, manufactured by the Colorado Iron Works, the only one said to be capable of producing a middling product in one operation and in a single cleaning circuit. This feature is expected to meet with wide acceptance in coal preparation and ore dressing operations, as it eliminates virtually all waste and permits the recovery of a higher yield of marketable product.

The separator also handles all normal sizes of material. It starts and stops readily and requires no auxiliary container to receive the load of material when operations are stopped. It uses no airlift, thereby eliminating the need for an auxiliary compressor.

The densifier is likewise an Akins product. The plants are so designed that Allis-Chalmers, Robins, or Simplicity flat, single, or double-deck screens can be used. The pumps are by Wilfley and the magnetic separator is a Dings "HM" Crockett type.

The basic layout of these plants has been carefully planned to provide for the use of standard rolled structural members. This applies to both columns and beams and eliminates the use of unsymmetrical sections. The result is greater structural rigidity and the elimination of eccentric loadings. This, and the fact that columns rest directly on concrete piers, reduces the amount of steel required.

Wide walkways and stairs, complete with guard rails and toe boards, provide protection for the operator and easy access to all equipment. Steel hoppers and launders are pre-fabricated and assembled for bolting in place. Open industrial grating is used for flooring to provide visibility from below or above.

Piping is pre-fabricated for field erection. An all-weather panel board, with central and interlocking controls, is located at the attendant's principal operating station. Interlocking sequence controls starts and stops equipment and prevents spills and overloading. It is not necessary to unload the separatory device to shut down the plant.

The controls and layout of the plant permits one-man operation. Where desired, the operator can also maintain the unit.

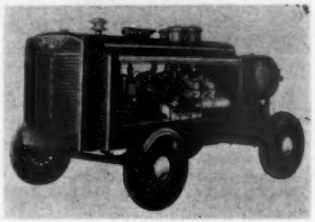
● Compressors

The new Davey air-cooled "Air Chief" compressors are available in 60-, 105-, 160-, 210- and 315-c.f.m. sizes. Various model numbers designate the output of the compressor in cubic feet of free air per minute. These units operate at relatively slow piston speeds through the use of short piston strokes (4½-in. for Models 60 and 105, 4-in. for Models 160, 210 and 315). They are designed for individual plant departments and are offered as replacements for large central compressor systems.

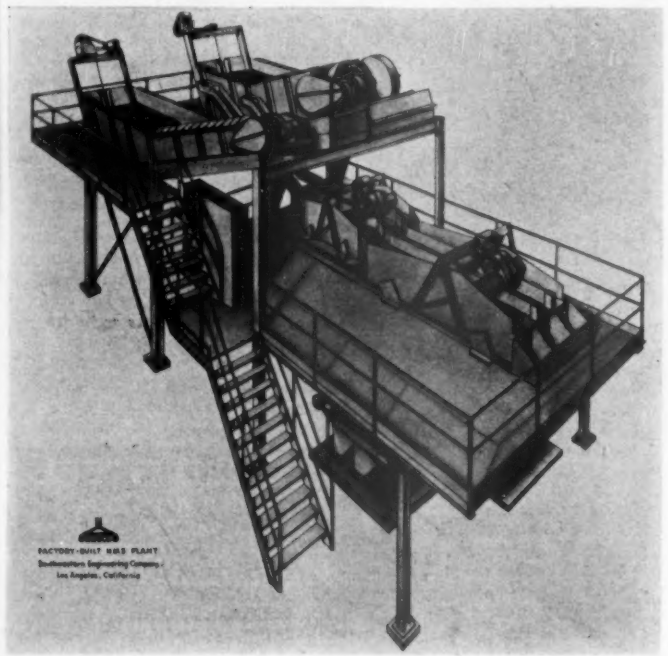
Aluminum alloy compressor heads and manifolds are utilized in all models. Since aluminum possesses three times the rate of heat conductivity of cast iron, this construction makes possible cooler compressor operation and permanent freedom from valve carbonization. The use of aluminum alloy crankcases makes possible substantial weight savings.

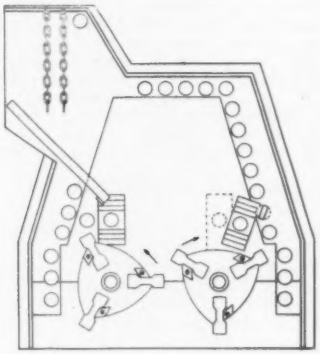
Other features include crankshaft mounting on heavy-duty, double row ball bearings, full force-feed lubrication and individual air cleaners for each low-pressure cylinder, which provides exceptional cooling of cylinders and heads during compressor idling periods.

The following advantages are cited by the manufacturer: increased overall



efficiency of compressor operations; maximum air operating efficiency for each department; reduced air losses; saving in electric power; elimination of plant shut-downs due to compressor failure; elimination of large water bills through efficient air cooling; ease of installation; economy and ease of plant expansion; reduced maintenance and replacement expense. The Davey Compressor Co., Kent, O.





This sketch shows the new design of the Primary Model "3030" double impeller breaker now being produced by the New Holland Manufacturing Co., Mountville, Pa. The dotted line at the right shows the former area of adjustment for the breaker bar set over the impeller at the right. The solid line shows how the breaker bar is now adjustable outward and upward to permit feeding longer slabs without bridging and to increase reduction. New Holland will continue to produce the present Model 3030 as a secondary crusher.

trade notes

John J. Moroney has joined the Dimond-Colloton Equipment Company of Milwaukee, Wis., as of July 1, 1949. Mr. Moroney was elected vice-president of the corporation, and also a member of the board of directors. He will be active in the company in a sales capacity.

Continental Gin Co. has announced the renewal of an agreement with SKF Industries, Inc., to act as a manufacturer and supplier of pillow blocks for the ball and roller bearing firm's industrial distributors in eight Southern states. Under the terms of the agreement, to run until 1954, Continental will continue to allocate a part of its foundry and machining facilities for the production and assembly of pillow blocks to meet expanding industrial requirements in North and South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, and Tennessee. All bearings for the housings will be supplied by the Philadelphia company.

The Pennsylvania Crusher Company, Philadelphia, Pa., a division of Bath Iron Works Corporation, has announced the appointment of John A. Plimpton as division manager.

Mr. Plimpton succeeds Stanley D. Hartshorn, who has completed 25 years of service with the crusher company as sales engineer, sales manager, and, since purchase of the company by Bath Iron Works Corporation, as general manager.

Prior to 1933, Mr. Plimpton spent eight years with the Pennsylvania Crusher Company, first in Pittsburgh, and then as manager of the Chicago office. From 1933 to 1947 he held important positions with standard Oil Company of New Jersey except for four years' leave-of-absence in World War II. In 1947 Mr. Plimpton returned to the Pennsylvania Crusher Company as district manager in New York City.

Four divisional managers have been appointed by the electrical wire and cable department, United States Rubber Company, to supervise sales of electrical wire and cable throughout the country.

Clarence H. Le Vee has been named Eastern Division sales manager, with headquarters in New York City. He will supervise sales in Boston, New York, Buffalo, Syracuse, Philadelphia, Baltimore, Atlanta and Pittsburgh branches.

J. A. Leuver has been appointed Western Division sales manager, with headquarters in Chicago. He will supervise sales in Cleveland, Detroit, Chicago, Cincinnati, Indianapolis, Milwaukee Minneapolis and Omaha branches.

Don B. Karlskind has been named Southern Division sales manager, with headquarters in Dallas, Tex. He will be in charge of branch sales in Birmingham, New Orleans, Houston, Dallas, Kansas City, Tulsa, St. Louis and Denver.

L. M. Guibara has been appointed Pacific Coast Division sales manager, with headquarters in Los Angeles. He will be in charge of branch sales in Los Angeles, San Francisco, Portland, Seattle and Salt Lake City.

Appointment of Harry T. Graham to the position of assistant general sales manager has been announced by Drew M. Thorpe, vice-president in charge of sales, General Refractories Company, Philadelphia, Pa.

Mr. Graham, has been with General Refractories since 1937. He assumed his new duties at the main office in Philadelphia on September 1.

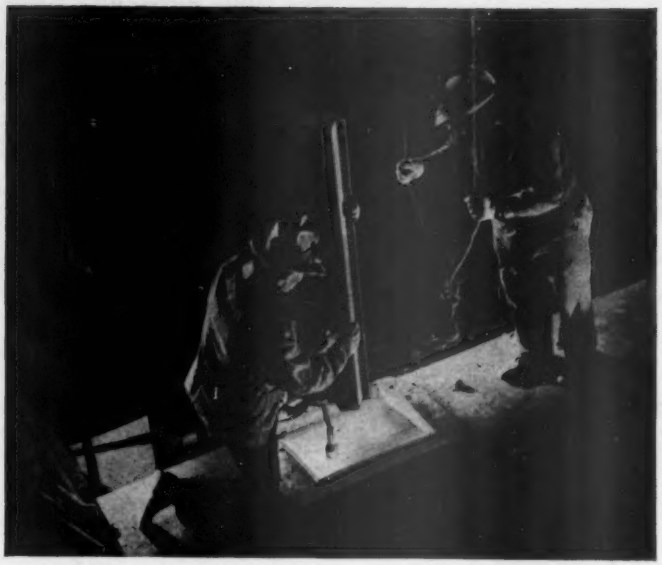
★ Modern pit methods call for *Easy Handling MM Industrial Wheelers.* The new 27 and 49 h. p. heavy duty models are large capacity . . . can go anywhere . . . speeds up to 14.5 m.p.h. Operators save time with quality MM Industrial Wheelers . . . *built for dependability, ruggedness and easy maneuverability.*

A wide variety of attachments enable owners of MM Industrial Wheelers to do the work where larger and less maneuverable machines fail . . . *and do it at lower cost.*

MM Industrial Power Units for crushers, conveyors, pumps and screens are available from 25 to 230 h. p.

See Your MM Dealer-Distributor or Write

MINNEAPOLIS-MOLINE
MINNEAPOLIS 1, MINNESOTA



Better and More Economical Grinding with U·S·S LORAIN ROLLED PLATE LININGS

ON all sorts of grinding jobs, Lorain Rolled Plate Linings are helping to increase production, save time, and cut costs. Because the parts are made to accurate size and in easily handled sections, they save hours of labor and reduce mill down-time. And because of the great strength of rolled carbon steel, a plate of reduced thickness can be used—thereby increasing the usable diameter of the mill and boosting output.

As lift bars wear down in service, Lorain Rolled Plate Liners may be restored to full grinding efficiency and the equivalent of a second lining by renewing the lift bars, at only partial lining costs. Where pronounced variance in wear occurs at feed and discharge ends, the liner plates, being made symmetrical and interchangeable, may be reversed to opposite ends of mill to balance wear. Such flexibility and ease in restoring lining efficiency means reduced grinding costs.

U·S·S Lorain Rolled Plate Linings are available through leading mill manufacturers whose names will be furnished upon request.

U·S·S GRINDING BALLS

To make better grinding doubly sure, use U·S·S Grinding Balls. They're specially made, to definite specifications, for the grinding industry. These tough, hard and long-lasting balls are available in all standard sizes from ¾" to 5" in diameter.

CARNEGIE-ILLINOIS STEEL CORPORATION, PITTSBURGH & CHICAGO
COLUMBIA STEEL COMPANY, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS
TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM, SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK
9-1218

USS

LORAIN ROLLED PLATE LININGS AND GRINDING BALLS

UNITED STATES STEEL

Bemis Bro. Bag Co. announces that its multiwall plant in Houston has reached full production and is capable of supplying all types of multiwall paper shipping sacks in the Texas area.

The stockholders of the Allis-Chalmers Manufacturing Company have elected Walter Geist to his eighth term as president of the company, and at the same time re-elected all officers and directors of the firm.

Directors renamed at the annual meeting are James M. Barker, W. C. Buchanan, Arthur W. Butler, Hugh Comer, James D. Cunningham, W. C. Johnson, Walter Kasten, Ernst Mahler, Louis Quarles, Leigh Willard, and W. A. Roberts. Mr. Geist also was re-elected to the board.

Joseph H. Parsons and Robert B. Pogue have been appointed vice-presidents, and Rosser L. Wilson has been appointed chief engineer of the Brake Shoe and Castings Division of American Brake Shoe Company.

Mr. Parsons, formerly assistant vice-president, will be in charge of miscellaneous castings sales. Mr. Pogue, formerly chief engineer, continues in charge of engineering. He has been chief engineer of the division since 1937.

Mr. Wilson, formerly assistant chief engineer, joined the company as an engineer in 1935.

Chain Belt Company of Milwaukee announces the opening of a new modern warehouse in conjunction with new expanded facilities for the Dallas district sales office at 1611 Dragon Street, Dallas, Tex.

With these new modern facilities, Chain Belt's Dallas Office and its local distributors can promptly supply both Rex and Baldwin Rex Chain, transmission parts, shafts, sprockets, speed reducers, bearings, pulleys, etc. Special assistance can be given on planning, machining and assembly of unusual power transmission and conveyor requirements.

The Lima Shovel and Crane Division, Lima-Hamilton Corporation, Lima, O., has appointed six new sales representatives for its line of power shovels, cranes and draglines.

The Flack Equipment Company, P. O. Box 1526, Toledo 4, O., will cover the Toledo sales area; John C. Louis Company, 511 W. Platt Street, Baltimore, MD., will cover the District of Columbia, Maryland, Delaware, with the exception of New Castle County, Arlington, Fairfax, and Loudoun counties in Virginia.

The Buran Equipment Company, 777 100th Avenue, Oakland, Calif., will cover the territory for northern California; Metalweld, Inc., 26th and Hunting Park Avenue, Philadelphia 29, Pa., will cover the Philadelphia sales area; Scott Machinery Company, 84 South Main Street, Concord, N.H., will cover New Hampshire; and Stockberger-Seastrom, Inc., 2200 North Mannheim Road, Melrose Park, Ill., will cover the Chicago area.

The McLanahan & Stone Corp. had an attractive float in the centennial parade which marked the 100th anniversary of the City of Altoona, Pa. McLanahan & Stone is Blair County's oldest industry, having been founded in 1885. Mounted on the float were an ore crusher and a foundry ladle.

The Dorr Company will move its main office, presently located at 570 Lexington Ave. (the General Electric Company Building) New York, N. Y., to Stanford, Conn., in December of this year, in order to provide larger office space and better working condition in an atmosphere less crowded than Metropolitan New York, for its main office staff of about 225 persons. The new office will be located in the Northam Warren Building on Barry Place. An office will be continued at the present New York City address for the convenience of executives of the company, foreign and other visitors, and to accommodate a branch sales office.

B.T. Eagerton

The appointment of B. T. Eagerton to the position of vice-president in charge of the Export Division of the Nordberg Manufacturing Co., Milwaukee, Wis,. has been announced. Mr. Eagerton has been export manager since 1946.

Previously he operated his own automotive equipment distributing agency, after which he was associated with the Standard Gas Engine Company, the Cleveland Tractor Company and the Oliver Corporation, which merged with Cleveland Tractor.

The appointment of W. J. Howell as assistant to Tomlinson Fort, manager of sales for the Westinghouse Electric Corporation, Pittsburgh, Pa., has been announced by Mr. Fort.

In March, 1941, Mr. Howell was appointed assistant to the district manager, Pacific Coast District, with headquarters in San Francisco. He has served in that capacity until his present oppointment.

Henry H. Allen, vice-president and a director of Bemis Bro. Bag Co., recently celebrated his 60th year with Bemis. Mr. Allen is in charge of Bemis eastern operations, with headquarters in New York.

His active association with the bag industry started in 1889 when he joined the Bemis organization of Omaha, Neb. Two years later he was made superintendent of the Omaha plant.

Subsequently he served Bemis in various capacities in St. Louis, Kansas City, Brooklyn and New York City. In 1912 he was elected secretary of the company and became a member of the board of directors. He was made a vice-president in 1921.

What other ⅜ or ½ yard truck shovel has *all* these features?

. . . *cast steel turntable* with deck and side-frames cast in one piece, insuring constant true alignment of shafts and bearings, longer trouble-free service.

. . . *all shafts splined and ball bearing mounted* plus machine-cut gears and sprockets for smoother, longer-lived operation.

. . . *interchangeable turntable shafts, bearings and clutches.*

. . . *tapered hook rollers, ball-bearing mounted,* easily adjustable for wear.

. . . *air-ram operated clutches* that are fingertip controlled—that are fast, positive, dependable.

From wheels to boom-point you get more fast-production, cost-cutting features in a MICHIGAN. That's why I selected MICHIGAN . . . and it's why I say *you'll get the most for your money in a MICHIGAN!"*

Write for your copy of Bulletin 100, "On the Job with MICHIGAN," showing MICHIGAN Truck Shovels on jobs like yours.

DID YOU KNOW
you can buy
a brand new
MICHIGAN
TRUCK CRANE
complete with chassis
for as little as $10,250
F.O.B. factory?

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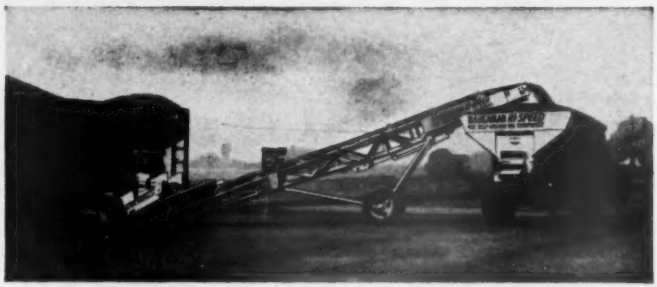
MICHIGAN POWER SHOVEL COMPANY
315 Second Street, Benton Harbor, Michigan, U.S.A.

designed for all materials

Baughman

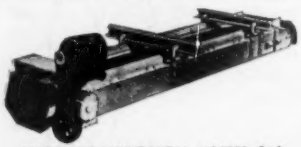
HIGH-SPEED PORTABLE

Conveyor Teams



MODEL 164 OPEN TROUGH BELT CONVEYOR
Shown in use with Model 155 Hopper Car Unloader.

MODEL 155 ARCHED DELIVERY HOPPER CAR UNLOADER
Furnished with steel or drop center rim wheels.



MODEL 190 HORIZONTAL HOPPER CAR UNLOADER
For large users with semi-permanent trackage set-up.

ADAPTABLE to all materials and condition, Baughman *HI-SPEED* Conveying Equipment is expertly designed to cut handling costs to a minimum. Portable—so that the same Conveyor Teams can be used on several locations—to reduce your equipment costs. Precision-built of the finest quality materials, by expert craftsmen, for years of low-cost, trouble-free service. Baughman *HI-SPEED* Conveying Equipment is competitively priced. We are able to keep our equipment well within the low price range due to our assembly line method of production—and these savings are passed on to you. We welcome the opportunity to discuss your particular problem, without obligation.

Some Valuable Sales Franchises are Still Available. Write for Information.

MODEL 160 CARRY-UP TROUGH BELT CONVEYOR
Ideal for pick-up work in yard or from under car.

If It's *HI-SPEED* . . . It's *BAUGHMAN*

manufactured by
BAUGHMAN MANUFACTURING CO. Inc

8109 ARCH STREET, JERSEYVILLE, ILLINOIS

Henry W. Dodge has joined Mack Trucks, Inc., as executive vice-president with special responsibility for sales and advertising.

Mr. Dodge, chairman of the board and director of Air Products, Inc., at the time of acceptance of his new position, was on loan to ECA as chief of petroleum on the staff of Ambassador W. Averell Harriman in Paris. He resigned both positions as of June 30.

Formation of Mechanical Industries, Inc., a new engineering company whose activities will be limited to industrial ventilation, smoke, dust and fume control with headquarters here has been announced by Morton I. Dorfan, president and general manager.

Previously he had served in similar capacities with Allis-Chalmers Co., Pangborn Corporation, Blaw-Knox Co., and as a private consultant to industry.

Headquarters of the new concern are in the Frick Building, Pittsburg, Pa.

The Cardox Corporation announces the appointment of Layne-Northwest Company, 6005 W. Martin Drive, Milwaukee 13, Wis., as the Cardox-Hardsocg surface drilling equipment distributor for the southern half of Wisconsin.

The Euclid Road Machinery Company, Cleveland 17, O., announces the following changes made recently in the Euclid distributor organization:

Euclid-Kentucky, Inc., Louisville, Ky., has taken over the Euclid distributorship for Kentucky, replacing Brandeis Machinery & Supply Co., Inc.

Reid-Holcomb Company, 1815 Kentucky Avenue, Indianapolis, is being assigned southern Indiana territory formerly served by Brandeis.

Euclid Sales & Service, Inc., 5231 Manchester Avenue, St. Louis 10, Mo., take over southern Illinois counties formerly covered by Brandeis.

Clark-Wilcox Company, 118 Western Avenue, Boston 34, Mass., has been assigned the following territory: Maine and parts of New Hampshire formerly assigned to Eastern Tractor & Equipment Co., plus Vermont. This is in addition to their present coverage of Rhode Island, counties east of and including Worcester in Massachusetts and several counties in New Hampshire.

H. T. Reishus, general manager, International Harvester industrial power division, has announced a change in structure in the engineering department and the following appointments:

W. O. Bechman, chief engineer, advanced engineering group; M. R. Bennett, chief engineer, product engineering group; H. V. Parsley, chief engineer, government engineering group; and J. W. Curley, chief engineer, experimental and test group.

The reorganized functions of industrial power engineering will be under the direction of D. B. Baker, manager of engineering.

• The first of the new heavy-duty "H" models, recently announced by GMC Truck & Coach Division of General Motors, is shown being driven off the assembly lines at Pontiac, Mich., by M. D. Douglas, general manager. Other GMC executives taking part in the ceremony are (left to right): J. E. Johnson, sales manager of the Truck Division; P. G. Dempsey, superintendent of truck production; and J. S. Falberg, factory manager. The new line is comprised of 61 basic models.

Reorganization of the LeTourneau Service Department into Eastern, Central and Western territories has been announced by the LeTourneau company. Cloyd W. Richards heads the department as general service manager Pat Edwards is Eastern service manager; George Crafton, Central selvice manager; and Jack Lewls, Western service manager. The territories they supervise correspond to those designated as Eastern, Central and Western sales areas, All of the service managers headquarter at Peoria.

Clyde E. Clair has been named special service representative, with headquarters at Peoria. Robert L. Gilmore, coordinator of claims for the last two years, has been made claims manager.

H. C. Peterson has been named sales manager of Arkell & Smiths, multiwall bag manufacturers, as recently announced by R. P. Smith, vice-president.

William W. Moore, since April, 1945, a sales representative in Allis-Chalmers Detroit district office, has been named manager of the company's newly converted Toledo district office.

J. Charles Allen assumed his duties as chief engineer of the Atlas Powder Company, Wilmington, Del., on August 1, succeeding J. W. Hanson Jr., who has retired. Charles G. Hersh succeeds Mr. Allen as assistant chief engineer.

Mr. Allen joined Atlas in 1918, working with engineers of the company during the construction of the Perryville, Md., ordnance plant. After World War I he joined the company's engineering staff as electrical engineer, being appointed assistant chief engineer in 1929.

Mr. Hanson had a background of experience with several Atlas explosives plants before he came to Wilmington to organize the Atlas engineering department in 1917. Since that time, with the exception of a period of six years as manager at the Stamford, Conn., industrial finishes and coated fabrics plants of Atlas, he has been chief engineer and director of this department.

J. D. McDermott has been appointed manager of the Ryertex Division of Joseph T. Ryerson & Son, Inc., steel distributors, Chicago, Ill. He succeeds Kenneth T. MacGill, who has retired after 32 years of service with the company.

Mr. McDermott moves up from the post of western sales manager of the Ryertex Division, a post to which he was assigned in 1948. He has been with the company since 1923, serving as sales representative in Cleveland and Pittsburgh, respectively, prior to taking up headquarters at Chicago last year.

Link-Belt Company announces that, in the process of expanding its facilities the following officers have been moved into larger quarters: The Cleveland office, headed by Paul V. Wheeler, is now located at 314 Hanna Bldg., Cleveland 15. The Baltimore office, in charge of Charles C. Wiley, district manager, has been moved to 2315 St. Paul St., Baltimore 18. The L-B office in Huntington, W. Va., headed by David W. Stevens, is now at 1009 Fifth Ave., Huntington 1. New address of the office in Newark, N. J., headed by John D. Riley, district manager, is 212 Essex Building, 31 Clinton St., Newark 2.

Three executive appointments have been announced by the Westinghouse Electric Corporation of Pittsburgh.

Tomlinson Fort has been named manager of the apparatus sales department; William W. Sproul is sales manager of industrial products; and Roy C. Bergvall is engineering manager of industrial products.

All three of the new executives will report to John K. Hodnette, vice-president and general manager of industrial products.

Depco Detroit Corporation has been appointed Marion Power Shovel Company distributor for all of the Lower Peninsula of Michigan with the exception of several counties in the southwestern corner of the state. The concern maintains sales offices in 2914 Book Tower, Detroit, and parts and service facilities at 12756 Southfield.

Depco Detroit will represent Marion in clutch-type machines, Types 33-M through 111-M.

• A precision hydraulic press for conveyor belts, said to be the "world's largest", was recently put into successful operation at the Passaic, N. J., factory of the Manhattan Rubber Division, Raybestos-Manhattan, Inc. Built by the Baldwin Locomotive Works, the press will vulcanize conveyor belts under controlled pressure and temperature. The assembled press weighs about 320 tons. A check of several of the 40-ft. platens indicated that there is less than a 2-degree variation in temperature over any one platen surface, despite sudden and large load changes.

legal decisions

By LEO T. PARKER
Attorney at Law

Recently a reader wrote, as follows: "I have a good idea for an invention which I want to patent, when I get the idea perfected. What can I do to protect myself without filing an application for a patent? Also, if I get a patent, can I prevent competitors from using my invention? If the Patent Office grants my patent, am I certain to make money on it?"

First, it is important to know that the United States Patent Laws were formulated *especially* for the purpose of creating interest in inventors and to *induce* them to exert their inventive genius toward inventing new and improved things to benefit the general public, and to guarantee that inventors will earn a profit. Also, our laws were devised for the primary purpose of inducing inventors to *file* in the United States Patent Office applications for patents in which details of the invention must be illustrated by drawings and clearly explained in the specifications whereby, after expiration of a patent, *any person* may consult the Patent Office files and learn how to make the invention.

Our government offered the exclusive right to inventors to *make, sell and use* their inventions for 17 years. After this term expires there is *no plan* by which an inventor can renew or extend the life of his patent.

There is no plan by which an inventor can have protection against appropriation of his invention, except to file the application in the United States Patent Office. Therefore, if an inventor has perfected his invention, the safest and best plan is to file an application for a patent. If, on the other hand, the inventor has not perfected the invention, here are the proper things to do: First, purchase a book and make *written* notes and *explanations* of *every* experiment, and *date* these various sheets. Occasionally it will be advisable to permit a dependable person to witness an experiment, in which case his name and address should be written on the dated sheet on which the experiment is explained. When the device is perfected, the inventor may then file an application for a patent. In the United States the owner of an invention, and the one who has a legal right to the patent, is the person who was *first* to invent it and make the invention operate. Hence, a person may obtain a patent, but if he is not the original inventor, he is *not* the legal owner of the patent; the person who *first invented* the device may appeal to the court, which will take the patent from the one to whom it was wrongfully issued, and award the patent to the original inventor, if the latter did not delay too long in filing his application for a patent.

Patents Held Void

Another important point of law is that an inventor's troubles are *not* over after he obtains a patent, although he is the original inventor. In other words, the patent will be promply declared void if the court decides that the invention is not new or useful.

See *Richmond Screw Anchor Company v. Umbach*, 173 Fed. (2d) 521, reported June, 1949. Here it was shown that an inventor obtained a patent which included the following elements: (1) tie rods which extended through the form for concrete; (2) spacers for holding apart the sides of the form; (3) screws

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to Speed Up Material Handling —and Reduce Costs

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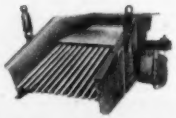

Feed and Scalp in One Operation

Increases crushing capacity and efficiency.

Bypass fines—oversize to crusher.

Smooth, controlled flow assures even belt loads.

Cushions the heavy, abrasive lumps on a bed of fines, and prevents rollback of lumps on steeply inclined belts.

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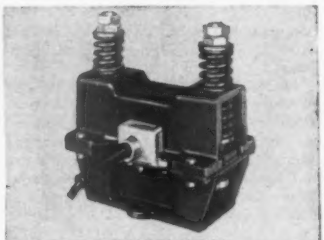

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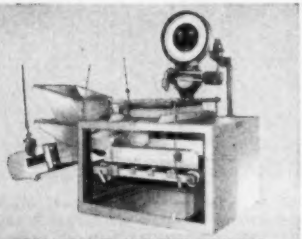
Make Stubborn Materials Flow Freely

VIBRATORY FEEDERS
Up to Hundreds of Tons per Hour — Rheostat Control of Flow



"CONSTANT WEIGH" FEEDERS
Accurate, Continuous Feed by Weight

VIBRATING SCREENS
Wet or Dry — Single or Multiple Decks

for holding the sides of the form securely to the tie rods and (4) break-off points on the tie rods to permit the user to break off the ends of the rods which project from the concrete after it is set. Also, this inventor obtained *several* other patents on different kinds of tie rods and devices for supporting forms used in constructing concrete walls. These patents are as follows: Numbers 1,857,610; 1,919,751; 2,020,912; 2,107,130; 2,162,-592; 2,222,339.

The higher Federal court held *all* of these patents void, and said:

"Ties of different shapes—round wire and flat bars—were old. Spacers on the tie rod for the concrete form, in a wide diversity of detail, were old. Holders on the ties for the sides of the form in the form of wedges, screws, welded and integral members were old, as well as means for twisting or breaking off the rod in the concrete after the latter had hardened . . . . Tie rods for supporting forms used in the construction of concrete walls were extremely old in the art. There are many prior patents which disclose ties extending through the form walls and the concrete, spacers for holding apart the sides of the form for the concrete, devices for holding the walls on the ties during the pouring of the concrete and means to break off the projecting ends of the ties after the concrete had set."

Hence, although this inventor expended many thousands of dollars in obtaining the above-mentioned several patents, the court held all of them void and of no value because prior patents and illustrations published in magazines disclosed similar inventions.

This court held that no patent is valid if (1) a similar device was patented previously by another inventor; or (2) if a similar device was previously made or used; or (3) if a similar device was published or illustrated in any magazine or publication more than one year prior to the date the inventor filed his application for the patent.

Readers who desire to obtain and read the above-mentioned complete patents may apply to The Commissioner of Patents, Washington, D. C. Send 25 cents for each patent and give the numbers of each patent desired.

Seller Misrepresented Truck

According to a recent higher court a seller is liable on a guarantee where he unintentionally misrepresents the year's model of a used motor truck although the buyer is familiar with the different models and should have known that the seller was mistaken.

For illustration, in *Gris v. Tucker*, 216 S. W. (2d) 276, the testimony showed these facts to be true: One Tucker was hauling gravel with a 1942 Ford dump truck. He went to a truck dealer to obtain a later model truck. The seller told Tucker he had three trucks, two of which were 1946 models and one was a 1947 model each priced at $1,750. Tucker decided to take the 1947 model, and made a deal by which the seller accepted Tucker's 1942 model truck in trade at $500, and $1,250 in

"Meeting specs. to a T with SECO SCREENS"

Herman E. Bunce, Waverly, N. Y.

"We know the value of clean, properly-sized materials," says Mr. Bunce. "That's why our new aggregate plant is completely equipped with Seco vibrating screens."

"Our Secos do everything from scalping to final sizing and washing. We like the way they take the load without bogging down."

"In the comparatively short time we've been in operation, Secos have proved themselves worthy of the job we want done. We recommend them, unhesitatingly."

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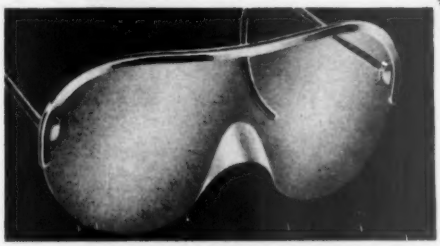
WILLSON . . .
has the remedy!

In order to get the goggles out of a worker's pocket, add the comfort factor to protection in eye safety equipment. You'll go a long way towards curing workers of such neglect.



FeatherSpec Style FW2

Here is comfort in nine-tenths of an ounce. WILLSON FeatherSpecs* with a large, overall plastic lens rest lightly on the nose and can be worn all day—even over prescription spectacles—without fatigue. Workers say they hardly know they are wearing any eye protection. Yet they prove adequate protection on many jobs such as light grinding, woodworking, spot welding and inspection of work in process.

If you want your investment in safety equipment to pay off—don't neglect comfort in your specifications.

DAILY REMINDERS

Daily reminders such as WILLSON "Blind Man" safety posters keep workers in hundreds of plants aware of the need for personal safety measures. Supplies are available on request.

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cash for the 1947 model truck. Hence, Tucker actually paid $1,750 for the truck.

Tucker operated the truck for 60 days and was well pleased with the way it functioned, but he noticed that the license receipt had been changed from 1946 to 1947 and became convinced it was a 1946 model. He went to the seller and asked for an adjustment of the difference in the value of a 1946 and a 1947 model. The seller refused to make any adjustment saying that Tucker had examined the truck, and drove it before making the purchase and should have known it was 1946 model, since he was well acquainted with all Ford truck models.

Nevertheless the higher court held that the seller must pay Tucker $300 damages. This court said:

"It is the settled rule that covenants, promises and assertions made by a seller concerning the quality of an article sold, if relied upon by the buyer, amount to warranties. . . There was ample testimony to the effect that a Ford dump truck of 1946 model was worth on the used car market from $300 to $350 less than a 1947 model Ford dump truck."

This court explained further that if the seller had proved that *before* making the deal for the truck Tucker *knew* that it *was* a 1946 model *instead* of a 1947 then, under these circumstances, the seller would *not* have been liable. This is so because a purchaser cannot recover damages based on a seller's fraud or warranty if the purchaser knew, *before* he made the purchase contract, that the seller *was practicing fraud.*

On the other hand, a seller always is liable for fraud or guarantee if the purchaser purchased the merchandise *when relying* on fraudulent statements made by the seller.

See *Moriss Company v. Huss,* 113 S. W. (2d) 891. This court held that when the testimony shows that the buyer did not know from his own experience whether the representation made by the seller was true or false, but the purchaser relied solely upon the statements of the seller, such representations *became warranties,* and a breach of such warranties on the part of the seller entitles the purchaser to sue and recover damages equal to the difference between the value of th guaranteed merchandise and the actual value of the goods delivered to the purchaser.

Must Prove Negligence

According to a recent higher court the seller of non-metallic products is not liable for injuries to customers unless the injury positively resulted from negligence of the seller.

For example, in *Snyder v. McDowell,* 203 Pac. (2d) 225, the testimony showed that the ceiling of a display room fell on a customer who received severe permanent personal injuries. She sued the property owner for damages. In holding the latter *not* liable the higher court said:

"Negligence is never presumed, but must be established by proof . . . . The plaintiff (woman) has not pleaded that the defendants (dealer) committed any

act which violated any duty they owed her. There is no allegation leading to any conclusion that the defect in the ceiling was observable by due care, or that defendant failed in any duty it may have had to make proper inspection and remedy the defect."

For comparison, see *Potter v. Rorabaugh-Wiley Company*, 112 P. 613, 32 L.R.A., N.S., 45. Here a property owner was held liable in damages for injuries sustained by a pedestrian when an awning fell on him. However, in this case the testimony proved that the property owner's employees were *negligent* in failing to attach the awning securely to the building.

Agent Not Authorized

An important point of law is that a *properly* authorized employee, or agent can make valid contract which obligates his employer. On the other hand, the mere fact that an agent makes a contract *intending* to obligate his employer does *not* obligate the employer unless the other party to the contract convinces the jury that the agent *had* proper and legal authority.

For example, in *Johnson v. Shook and Fletcher*, 16 So. (2d) 406, the higher court refused to hold a sand and gravel company liable on a contract made by an agent who attempted to bind the company to mine and deliver 2,500,000 tons of material and haul the material from a washer to a crusher. The court decided that the testimony did not prove that the employee was authorized by his employer to make the contract. Also, this court held that one dealing with an agent must not *blindly* trust the agents *own* statements as to the extent of his authority to make contract which obligate his employer.

Also, *Bureau v. Whealton*, 145 Pac. (2d) 912. Here the higher court held that a contract made by an unauthorized agent is void and cannot be given *any* effect whatever.

Cannot File Suit

Recently a higher court held that a corporation cannot file a suit in a foreign state, unless it has *fully* complied with the laws of this latter state.

For instance, in *Crites Company v. Associated Company*, 191 Pac. (2d) 650, it was shown that an Oregon state law clearly provides that all corporations located in other states and "doing business" in the state of Oregon must file with the state officials certain papers showing the location of its principal office and other data. Its representative in Oregon must also be made known to this state's officials.

A company located in another state sued a purchaser in Oregon to recover money due for purchased materials. Since the company had not complied with the above mentioned law the higher court held that the suit *could not be maintained*.

Wants Vacation

Modern higher courts consistently hold that an employee may receive compensation under the State Unemployment

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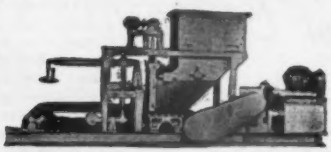

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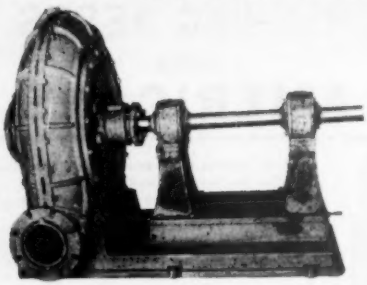

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Compensation Act *only* if he has "good cause'. In other words, a "laid-off" employee must accept *suitable* employment or he will be denied unemployment compensation.

In *Department of Industry v. Unemployment Compensation Board Review*, 49 Atl. (2d) 260, it was shown that one Bril was laid off. He applied for benefits under the State Unemployment Compensation Act and registered for work. Soon afterward he was referred to two prospective employers. He was offered employment at the prevailing wage, which was considerably *less* than he had been receiving. He rejected both jobs. The bureau denied his claim for unemployment compensation. The higher court upheld the bureau and refused to award compensation saying:

"The attitude of this claimant, disclosed by actions, lacks the essential ingredient of good faith. His refusal of referrals without interviewing the employers indicate an application for a vacation rather than for work . . . . "

Silicosis Disability

Considerable discussion has arisen from time to time over the legal question: If an employee contracts silicosis and *does not know* he has the disease, when is the employee required to notify his employer of his disability to comply with the "within one year" law notification The answer is: *At the time* the disease is ascertainable.

For example, in *Free v. Associated Corporation*, 52 S.E. (2d) 325, it was shown that an employee had been exposed a hazard of silicosis in the course of his employment and he did not know that he had contracted the disease. He delayed over one year before he notified his employer. The Commission refused to award compensation in view of a usual state law which provides that an employee must notify his employer within one year *from the date* the disease is contracted.

The higher court reversed the verdict, and awarded compensation saying that where an employee becomes disabled and this fact is unascertainable, he need not notify his employer until within one year after he knew he had the disease.

Circumstantial Evidence

Recently a higher court held that damages is allowable to injury to a cargo being transported on water, although the decision is based on circumstantial evidence.

For example, in *The Rocona v. Guy F. Atkinson Company*, 173 Fed. (2d) 661, it was shown that a company was using a number of barges to transport rock. One day a tug took in tow a barge, which had been loaded with rock, and towed it to the harbor. Later the barge capsized and it was discovered that a hole had been punched through the bottom planking.

In subsequent litigation the higher court held the owner of the tug liable for the loss, saying that the circumstantial evidence indicated that the tug's negligence in causing the barge to over-

ride the float punched the hole in the barge, causing it to capsize.

State Taxation

Considerable discussion has arisen from time to time over the legal question: What legal rule can readers use to determine whether nonmetallic products and materials are subject to taxation by authorities in the state in which the materials are situated?

For illustration, in *Empresa Siderurgica, S. A. v. County of Merced, California,* 69 S. Ct. 995, the testimony showed facts, as follows: A cement plant was sold to a corporation in Colombia for export to South America. The title to the plant passed to the purchaser in Colombia at once. After 12 percent of the plant had been shipped out of the country, the state tax authorities levied taxes on the remaining 88 percent of the value of the plant.

The purchaser of the plant appealed to the higher court, contending that it was not liable for payment of taxes because the plant was not in operation but being made ready for shipment out of the state.

The Supreme Court of the United States held that the purchaser *must pay* taxes to the state, and said:

"Goods do not cease to be part of the general mass of property in the state, subject to taxation in the usual way, until they have been shipped, or entered with a common carrier for transportation, to another state, or have been started upon such transportation in a continuous route or journey."

This court also explained that this same rule of law is applicable to nonmetallic products as rock, sand, gravel, cement and other products. In other words, if such products are not already *started* on movement to a point outside the state on the state's tax date, such products *are* subject to taxation.

Court Without Power

Recently a higher court held that *only* a city council can make or modify a zoning ordinance. Hence any contradictory order by a court is void.

For example, in *Little Rock v. Griffin,* 210 S. W. (2d) 915, the testimony showed facts, as follows: A corporation purchased two city lots to be used as a parking space for vehicles of itself, employees, patrons and other persons attending to business with the company. These lots are in an area zoned as *residential.* Owners of adjacent property filed suit to prevent this practice.

The corporation's counsel proved that it intended using the lots for parking automobile and motor trucks that previously had obstructed traffic and had been parked on the street. The lower court rezoned the lots into business property, whereby the corporation was privileged to use the lots for parking.

However, the higher court reversed the verdict saying that *only* a city council may make or vary a valid zoning ordinance.

Compensation Awarded

Modern higher courts consistently hold that an employee injured within the scope of his employment may receive compensation under the State Workmen's Compensation Act, although the employee previously suffered *similar* injury, or had a known disease.

For example, in *Dodge v. John D. Crane & Sons,* 59 Atl. (2d) 257, the testimony showed that an employee had a heart attack while loading a truck.

Although the testimony showed that the employee had for many years suffered from heart trouble, the higher court held that his widow could receive compensation under the State Workmen's Compensation Act, saying:

"The proofs well sustain a finding of an accident arising out of and in the course of employment."

No Negligence

A property owner never is liable for injuries to a customer whose own negligence cause the injury.

See *Esposito v. G. C. K., Inc.,* 60 Atl. (2d) 287. Here a customer sued for $5000 for injuries received by falling down a stairway.

The legal counsel won this suit by convincing the jury that the stairway on which the customer fell was neither defective nor dangerous. The court said:

"We find there was no competent evidence to establish any improper construction of the stairway. Negligence is never presumed. It is a fact that must be shown."

traffic news

CENTRAL TERRITORY RAILROADS FREIGHT TRAFFIC COMMITTEE

Docket 87106 (2)—Proposed to establish on agricultural limestone, unburned, in open-top cars, carload minimum weight 90 percent of marked capacity of car, except that when car is loaded to full cubical or visible capacity, actual weight will apply from Gibsonburg, O., to Lathrop, O., 205 cents net ton.

Docket 87112 (2)—Proposed to establish on slag, crushed, or crushed commercial (other than granulated), in open-top cars, carloads, minimum weight 90 percent of marked capacity of car, except that when car is loaded to full cubical or visible capacity, actual weight will apply from Hamilton, O., to Mt. Vernon, O., 183 cents net ton.

Docket 87129 (2)—Sand (except sand, molding, bonded [naturally or otherwise] and except ground or pulverized sand) or gravel, in open-top equipment, without tarpaulin or other protective covering,

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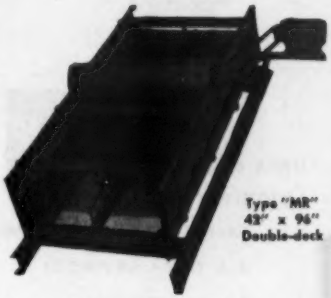

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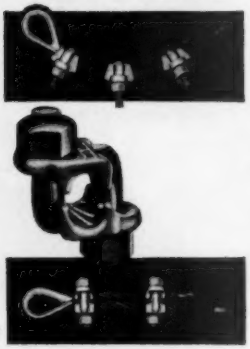

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carload minimum weight 90 percent of marked capacity of car, except that when car is loaded to full visible or cubical capacity, actual weight will apply, to Presto, Pa., from Beaver, Pa., 144 cents net ton, and from Follansbee, W. Va., and Brilliant, O., 155 cents net ton.

Docket 87130 (2)—Sand (except sand, molding, bonded [naturally or otherwise] and except ground or pulverized sand) or gravel, in open-top equipment, without tarpaulin or other protective covering, carload minimum weight 90 percent of the marked capacity of the car, except that when car is loaded to full visible or cubical capacity, actual weight will apply to Presto, Pa., from Akron, O., 199 cents net ton; Bellaire, O., 166 cents net ton.

GENERAL FREIGHT TRAFFIC COMMITTEE EASTERN RAILROADS

Bulletin G-610—Sand (except blast, core, engine, filter, fire or furnace, foundry, glass, grinding or polishing, loam, molding or silica) or gravel in open-top cars, carload minimum weight, 90 percent of marked capacity of car, etc., from Sargents, O., to Mullens and Tralee, W. Va., $2.32 per net ton including ExParte 162-B and 166-C increases but subject to Tariff of Emergency Charges X-168, in lieu of current combination rate. Reason: On same basis as rates applying from and to other points.

Bulletin G-666—Limestone, ground or pulverized, unburned, carload minimum weight 60,000 pounds, from Marble Cliff, O.

To	Open Cars Cents per ton	Closed Cars Cents per ton
Elk Horn Mine No. 6, Ky.	3.37	382
Elk Horn Mine No. 4, Ky.	337	382
Hardburly, Tribbey, and Combs, Ky.	315	360
Sunfire, Ky.	304	349

Rates include Ex Parte 162-B and 166-C increases but are subject to Tariff of Emergency Charges X-168. Reason: On same basis as rates applying to other points.

Bulletin G-704 (shippers)—Sand (except sand, molding, bonded [naturally or otherwise] and except ground or pulverized sand) and gravel, in open-top equipment. Rates will not apply on shipments in cars with tarpaulin or other protective covering, carload minimum weight 90 percent of the marked capacity of the car, except that when car is loaded to full visible or cubic capacity, actual weight will apply, but orders will not be accepted for open-top cars of less marked capacity than 80,000 pounds. When a shipper orders a car of above mentioned marked capacity or greater and the carriers are unable to furnish car ordered and furnish car of greater capacity than that ordered, the minimum weight of the car furnished will be that which would have obtained had the car ordered been furnished and used, from Bellaire, O., to Waynesburg, Pa., $1.88 per net ton, in lieu of current sixth class rate of $4.65 per net ton. Rates include ExParte 162-B and 166-C increases but are subject to tariff of Emergency Charges X-168. Reason: Comparable with rates applying from other points.

Bulletin G-708 (shippers)—Sand (except sand, molding, bonded [naturally or otherwise] and except ground or pulverized sand) or gravel, in open-top equipment.

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without tarpaulin or other protective covering, carloads, minimum weight 90 percent of marked capacity of car, etc., from Wheeling, W. Va., to New Alexandria, Pa., $1.66 per net ton, in lieu of current combination rate of $2.21 per net ton. Rates include ExParte 162-B and 166-C increases, but are subject to Tariff of Emergency Charges X-168. Reason: On same basis as rates applying from and to other points.

ILLINOIS FREIGHT ASSOCIATION DOCKET

Docket IRC 511-862—Crushed stone, carload, from Joliet, Ill., to Mendota, LaMoille, Van Orin and Ohio, Ill., minimum weight 90 percent of marked capacity of car, except that when car is loaded to full cubical or visible capacity, actual weight will govern, but in no case will the minimum weight be less than 40,000 pounds.

Present: Mendota, Ill., $1.39; LaMoille, Ill., Van Orin, Ill., and Ohio, Ill., $1.53. Rates per net ton include X-162 and 166 increases.

Proposed: Mendota, Ill., $1.21; LaMoille, Ill., Van Orin, Ill., and Ohio, Ill., $1.17. Rates per net ton, not subject to X-162 or X-166 increases.

Docket IRC 511-865—Sand and gravel, carloads, minimum weight 90 percent of marked capacity of car, except when loaded to full cubical or visible capacity, in which event actual weight will govern, from Peoria, Ill., to Benld, Ill. Present: 110 cents per net ton, subject to X-162 and X-166. Proposed: 97 cents per net ton, subject to X-162 and X-166.

Docket IRC 511-866—Rates on lime rock and limestone as described in Missouri-Illinois Railroad Tariff 22-J, ICC F-225, from Mosher, Ste. Genevieve, and Marlo, Mo., to Murdock, Ill. Present: Combination of locals. Proposed: $1.65 per ton of 2000 pounds, subject to Ex-Parte 162—166 and 168.

Docket IRC 511-868—Sand and gravel, carloads, usual minimum weight from Algonquin, Ill., to Elmhurst, Ill. Present: 50 cents per net ton, subject to X-162 and X-166. Proposed: 46 cents per net ton, subject to X-162 and X-166.

Docket IRC 511-869—Sand and gravel, carloads, in open equipment, from Afton, Beloit, Janesville, Wis., etc., to Chicago, Ill., and points in Illinois in the Chicago District, also points in Illinois to which specific rates are published. Present: Present basic rates, subject to increase of 15 cents per ton under X-162, 30 percent under X-166 and 6 percent under X-168. Proposed: Present basic rates, subject to increase 15 cents per ton under X-162, plus increase of 10 percent.

WESTERN TRUNK LINE NEW APPLICATIONS

Docket E-41-1121 (shipper)—Crushed stone, rip rap, minimum weight 90 percent of marked capacity of car, except that when car is loaded to full visible capacity, actual weight will apply, but not less than 40,000 pounds. From Gilmore City, Ia., to stations in South Dakota. Proposed—to establish a scale of rates for distances up to 300 miles.

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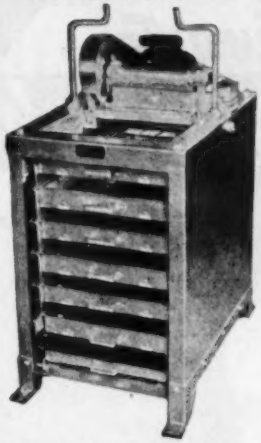

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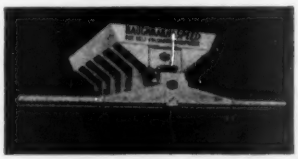

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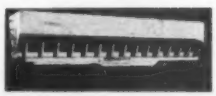

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1000	*Westg.	CW-224	589
1000	*Westg.	CW	720
800	*Westg.	CW	567
750	*G.E.	MT-16	450
700	*Westg.	CW	720
600	G.E.	IM	350
600	*Cr.Wh.	SR	514
600	*G.E.	IM	900
500	*Ideal	AV-590	1800
500	*G.E.	IM	720
500	*Al.Ch.	ANY	606
500	Westg.	HP	600
500	*Westg.	CW	600
400	*G.E.	MT-412	440
400	*Al.Ch.	ANY	514
400	Westg.	CW	900
400	*G.E.	IM	900
350	Westg.	CW	720
350	Al. Ch.	ANY	585
300	*Westg.	CW	367
300	G.E.	IM	450
300	G.E.	MT-410	450
300	*G.E.	IM-17B	450
300	*G.E.	IM	600

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Granite Rock Co.
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Duquesne Slag Products Co.
Franz Stone Company
General Crushed Stone Co.
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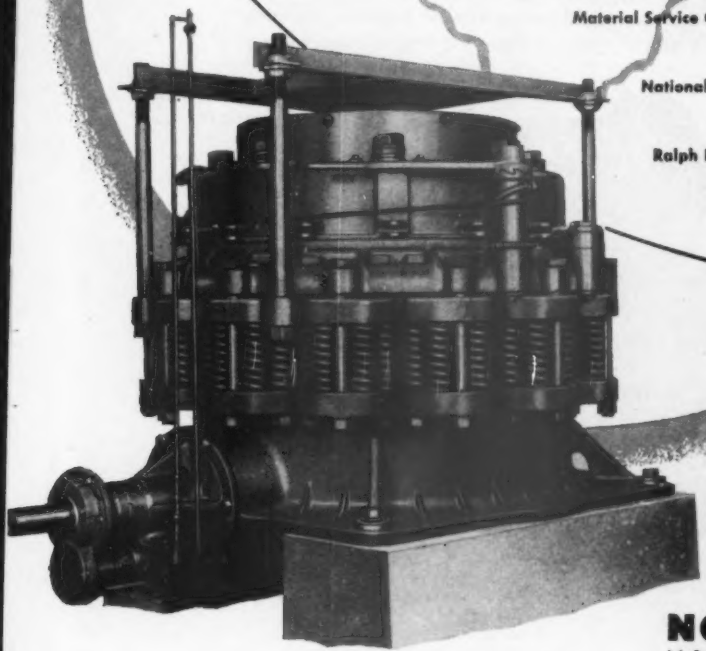
Thornton Quarries Corp.
Woodstock Slag Corp.



Symons Cone Crushers are available in three types—Standard, Short Head and Intermediate—in a wide range of sizes to fit your requirements. In addition, Nordberg manufactures primary gyratory and jaw crushers, vibrating screens, grinding mills, grizzlies, feeders, kilns, coolers, dryers and a complete line of diesel engines for all power requirements.

C949

NORDBERG MFG. CO.
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NEW YORK • SAN FRANCISCO • WASHINGTON • SPOKANE
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NORDBERG

Machinery for processing ores and industrial minerals

Gyratory and Jaw Crushers

Symons Cone Crushers

Vibrating Screens and Grizzlies

Grinding Mills

Diesel Engines

SIMPLICITY HORIZONTAL SCREENS

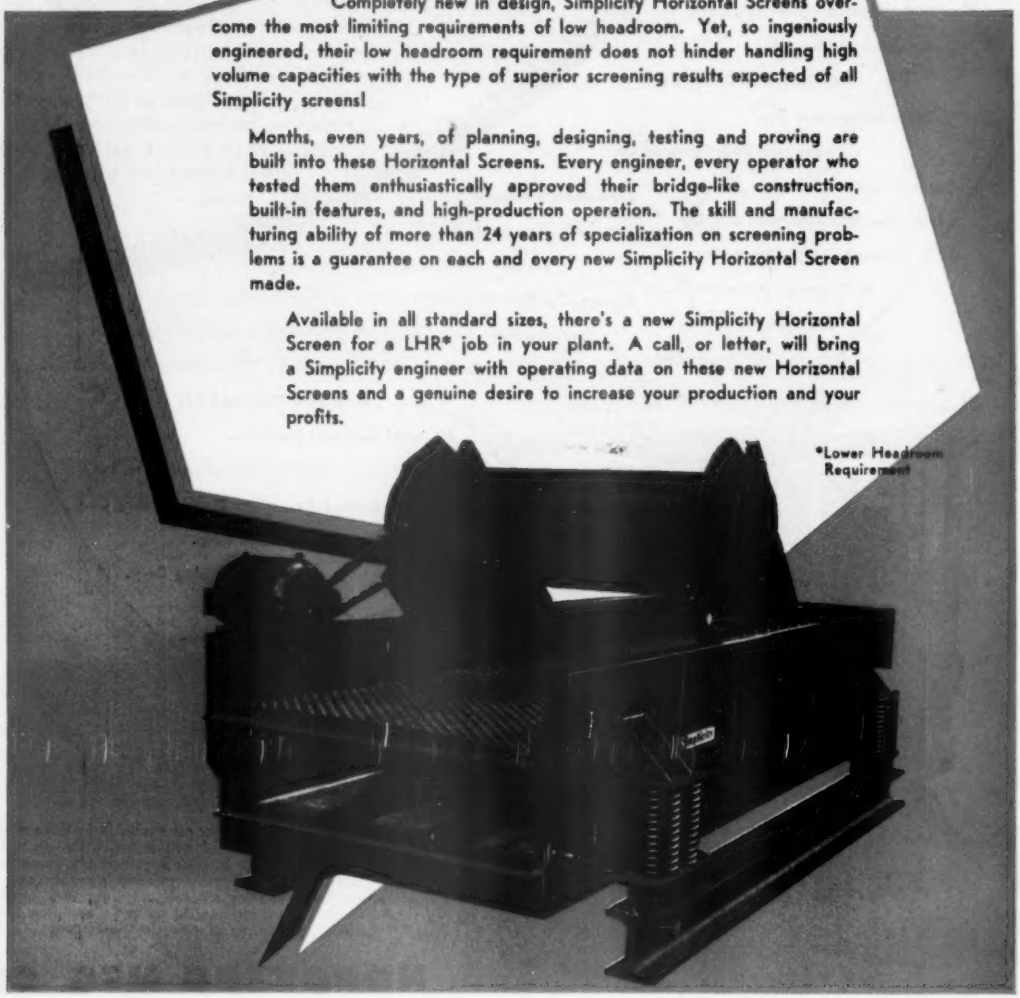
Now Available
Built in all standard sizes

Completely new in design, Simplicity Horizontal Screens overcome the most limiting requirements of low headroom. Yet, so ingeniously engineered, their low headroom requirement does not hinder handling high volume capacities with the type of superior screening results expected of all Simplicity screens!

Months, even years, of planning, designing, testing and proving are built into these Horizontal Screens. Every engineer, every operator who tested them enthusiastically approved their bridge-like construction, built-in features, and high-production operation. The skill and manufacturing ability of more than 24 years of specialization on screening problems is a guarantee on each and every new Simplicity Horizontal Screen made.

Available in all standard sizes, there's a new Simplicity Horizontal Screen for a LHR* job in your plant. A call, or letter, will bring a Simplicity engineer with operating data on these new Horizontal Screens and a genuine desire to increase your production and your profits.

*Lower Headroom Requirement



Simplicity
TRADE MARK REGISTERED

SIMPLICITY ENGINEERING COMPANY • DURAND, MICHIGAN

SALES REPRESENTATIVES IN ALL PARTS OF THE U. S. A. • FOR CANADA: CANADIAN BRIDGE ENGINEERING CO., LTD., WALKERVILLE, ONTARIO • FOR EXPORT: BROWN & SITES, 50 CHURCH ST., NEW YORK 7

THE CONCRETE MANUFACTURER

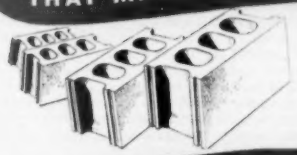
A SPECIAL SECTION OF PIT AND QUARRY

THREE FAR-FAMED MACHINES

STEARNS "15"—
"TOP ONE-MAN PRODUCTION"

JOLTCRETE—
"NO BETTER BLOCKS"

THAT MAKE THE BLOCKS



CLIPPER STRIPPER—
"BIG RETURNS—
SMALL INVESTMENT"

FOR THOUSANDS OF CONCRETE MASONRY HOMES

STILL ANOTHER OF THOUSANDS OF BEAUTIFUL, MODERN, FIREPROOF, WEATHER-TIGHT CONCRETE MASONRY HOMES

MODERNIZE WITH A STEARNS!
BACKED BY MORE THAN A
QUARTER-CENTURY OF KNOW-HOW

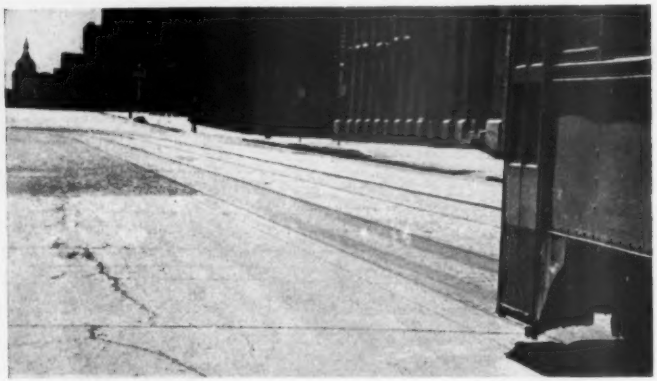
STEARNS 15 JOLTCRETES CLIPPER STRIPPERS

STEARNS
MANUFACTURING COMPANY • INC
ADRIAN • MICHIGAN

MIXERS SKIP LOADERS TURNTABLES SINTERLITE

First Ten Years *prove:*

Atlas Duraplastic* Air-Entraining Portland Cement makes concrete more durable



TEN YEARS AGO, in August, 1939, this concrete test paving was laid in Second Avenue North, Minneapolis. The badly scaled section of roadway in the background was made with regular portland cement. The foreground section, *laid at the same time,* was made with Atlas Duraplastic—the first commercial use of the air-entraining portland cement originated and developed by Universal Atlas.

Both sections, subjected to the severity of 10 Minneapolis winters and to heavy applications of de-icing salts, are shown above as they appeared in July, 1949—convincing proof of the characteristic durability of Duraplastic concrete, of its high resistance to freezing-thawing weather and the scaling action of de-icing salts. Longitudinal structural crack shows some ravelling. Note perfect transverse joint.

FROM its first small commercial use in 1939 to the super paving and construction jobs of today, the outstanding durability of concrete made with Atlas Duraplastic has won increasing recognition among engineers and contractors. Proof of its wide acceptance: In 1939, less than 60,000 barrels of Duraplastic were used for paving, then its sole use. In the following ten years, more than 25,000,000 barrels have been applied to an expanding variety of concrete uses.

For Paving Concrete, Duraplastic creates entrained-air cells in the concrete that minimize bleeding and segregation and thus protect it against the scaling action of freezing-thawing weather and de-icing salts (see photo). Less mixing water is required for a given slump. The resultant mix is more plastic, more cohesive, more uniform. It dumps, screeds and finishes easily.

For Structural Concrete, Duraplastic imparts to the mix the extra plasticity that aids proper placement. Water gain and segregation are reduced; surface appearance is improved. Because of these advantages *and* added durability, architects, engineers and contractors today rely on Duraplastic for all types of mass and structural concrete—for foundations, walls, floors, columns and other construction. And they find it readily adaptable to slip-form work, gunite, stucco and other uses.

For Concrete Products, finished units of block, brick, pipe, drain-tile, silo staves, etc., exhibit greater resistance to passage and absorption of water. For machine-made products, manufacturers find Duraplastic permits a damper mix that is more cohesive, holds together better and feeds easily through machines. Plants report savings in fewer culls and throwbacks and less breakage in handling green products.

For construction needs of today and tomorrow, Duraplastic offers *better concrete at no extra cost.* It provides the precise amount of air-entraining agent interground with the cement for satisfactory field performance. It complies with ASTM and Federal specifications, sells at the same price as regular cement and calls for no unusual changes in procedure.

Send for **New Free Booklet,** "A Decade of Atlas Duraplastic Air-Entraining Portland Cement." Write to Universal Atlas Cement Company (United States Steel Corporation Subsidiary), Chrysler Building, New York 17, N. Y.

OFFICES: Albany, Birmingham, Boston, Chicago, Dayton, Kansas City, Minneapolis, New York, Philadelphia, Pittsburgh, St. Louis, Waco.

*"Duraplastic" is the registered trade mark of the air-entraining portland cement manufactured by Universal Atlas Cement Company.

PQ-D-95

ATLAS DURAPLASTIC

TRADE MARK REG. U. S. PAT. OFF.

AIR-ENTRAINING PORTLAND CEMENT

MAKES BETTER CONCRETE AT NO EXTRA COST

A UNIVERSAL ATLAS PRODUCT

"THE THEATRE GUILD ON THE AIR"—*Sponsored by U. S. Steel Subsidiaries—Sunday Evenings—NBC Network*

NEWS OF CONCRETE MANUFACTURERS

Concrete Pipe Industry Loses Pioneer Producer In Passing of W. P. Hews

W. P. Hews, a pioneer of the concrete pipe industry and president and manager of the Yakima Cement Products Company, died on July 27 at Yakima, Wash.

A native of Maine, Mr. Hews went to Washington after being graduated from the University of Maine. He served in the armed forces in World War I as a captain of engineers. Upon his return to Yakima he established a concrete pipe business. He incorporated in his plant many unique ideas gleaned from the construction industry. His plant was a model of efficiency and progressive methods. Mr. Hews was active in state politics. the Rotary Club and other civic activities.

C. H. Bullen, A.C.P.A. Officer, Dies After One-Day Illness

On September 6 Clare H. Bullen, treasurer of the American Concrete Pipe Association, died after having suffered a stroke on the previous day.

Mr. Bullen was one of the pioneers of both the concrete pipe industry and the pipe-making equipment business. He was one of the oldest and most active members of the A.C.P.A.

After attending college at Yankton and Brookings, S. D., Mr. Bullen and his father founded the Portland Cement Products Company at Portland, Ore. From a small beginning that company expanded until it had 18 branches on the Pacific Coast. In 1926 Mr. Bullen sold his holdings on the West Coast, moved to Chicago, and founded the Mid-West Concrete Pipe Company.

Mr. Bullen was president of the A.C.P.A. in 1931-1932, a director of the association in 1924-1926, and 1933-35, vice-president in 1942, and treasurer from 1944 to the time of his death.

Actively interested in the Boy Scouts of America, Mr. Bullen was accorded the highest honor of the national organization, the "Silver Beaver". He was 76 years of age.

Texas Lightweight Industry Organizes State Association

Realizing the need of serving the builders of homes and commercial buildings more adequately, manufacturers of lightweight masonary units met recently in Austin, Tex., and organized the Texas Lightweight Concrete Masonry Association.

Charter member firms number 31—25 representing the lightweight concrete masonry industry and six the lightweight aggregate business. Five directors, including three officers, were elected to serve until January, 1950. Roy McCandless of San Antonio was elected an honorary member and director. Mr. McCandless is a former president of the National Concrete Masonry Association.

Directors and officers chosen include the following: John P. Sheehan, El Paso, president; George A. Meihaus, Fort Worth, vice-president; Robert Brown, Lubbock, secretary-treasurer; George W. Black, Houston, and A. J. Clark, Pharr, directors.

Active member firms are as follows: Precast Concrete Products Company, Austin; Houston Concrete Products Company, Houston; Volco Block Company, Pecos; F. C. George Machine Company, San Antonio; Black-Brollier, Inc., Houston; Burnet & Craig, Houston; Builders Supply, Inc., Pharr; Texas Concrete Works, Waco; Street Building Material Company, Houston; Universal Concrete Products Company; Foamrock Corporation, Stafford; Texcrete Company, Fort Worth and Dallas; Featherlite Corporation, Dallas; Texas Lightweight Aggregate Company, Dallas; Houston Concrete Products Company, Houston; Atlas Lime Company, El Paso; Lone Star Steel Company (Celocrete Lightweight Aggregate), Dallas; National Aggregate Corporation, San Antonio; Herculite Corporation, Rosenberg; and Texas Concrete Block Company, Lubbock.

Coming Events

October 10-14, 1949—San Francisco. First National West Coast meeting, American Society for Testing Materials, Fairmont Hotel.

October 24-28, 1949 — Chicago. 37th National Safety Congress and Exposition. Stevens, Congress, Morrison, Sherman, and Palmer House hotels.

November 21-22, 1949—Atlanta. Meeting of the Southeastern Division of the National Concrete Masonry Association, Atlanta-Biltmore Hotel.

January 23-27, 1950 — Chicago. 20th annual convention and exhibit, National Ready Mixed Concrete Association, Stevens Hotel.

February 6-9, 1950 — Chicago. 30th annual meeting, National Concrete Masonry Association, Hotel Sherman.

Frei Joins Smithwick— To Boss Construction Of $200,000 Plant

Otto C. Frei recently joined the Smithwick Concrete Products Company, Portland, Ore., as vice-president and general manager and also as a director. Smithwick's $200,000 aggregate plant was designed by Mr. Frei, who will supervise its construction.

Until 1941, Mr. Frei was associated with the Calaveras Cement Company at Merced, Calif. In that year he went to Orofino, Idaho, as vice-president and general manager for the Orofino Cement Company. Subsequently he became president of that firm. More recently Mr. Frei was president of the Columbia Portland Cement Company at Spokane.

Mobile Equipment Utilized At Government Test Station

In the government's big Point McGu missile test station project near Oxnard, Calif., Willard mobile equipment is being used exclusively for all ready-mixed concrete work, as announced by the Willard Concrete Machinery Co. of Lynwood, Calif.

The exclusive use of Willard equipment on this job is cited as an indication of growing interest in their new and revolutionary method of handling concrete from the mixing of aggregate to pouring. The Willard system eliminates the need for overhead bunkers and bins, being adapted to on-the-job mixing.

The complete unit consists of a mobile 3-cu. yd. weigh-batcher which is self-loading and self-powered; a self-powered portable conveyor which receives from the batcher and dumps into the dump mixer drum; and a light, strong one-man operated transit mixer which fits on any short 1½-ton truck.

Tuskegee Blocks Utilized In Low-Cost Church Building

By utilizing free labor and a special concrete block developed at the Tuskegee Institute, the members of the St. John's A.M.E. Church in Tuskegee hope to build their new church for only about $2,000.

Members have made the wooden molds for the blocks, which will be 16 by 8 by 3 inches and will cost about 4 cents each. The same individuals will make the units and lay them up, working without charge at night and week-ends. Local cement and gravel from nearby creekbeds will be used in the blocks, which have not as yet been released for commercial use. Four of the men working on the church have already begun making Tuskegee blocks for housing units.

Students attending a course for apprentice bricklayers in Kalamazoo, Mich., recently visited the plant of the W. E. Dunn Manufacturing Company in Holland, Mich., to watch manufacturing operations of the various devices made by this firm. Here they are seen viewing a drain tile machine in action. The Dunn company, founded in 1904, builds the machines for making Dunbrik-Dunstone, Duntile (roof tile), Champion drain tile, Korpak and Success block, Brikcrete and Colorcrete. During the tour the students were also conducted through the laboratory, the demonstration room, the machine shop and the color building.

8-Mile Concrete Pipeline Laid by California Firm

At Five Points, 25 miles west of Clovis, Calif., members of the Clovis Concrete Pipe Company's staff recently completed laying 8 miles of 16-in. concrete irrigation pipe at the Thomas ranch.

Turning out the big order required 50 days at the plant of Nick Vuicich and Louis Sikovich. Laying the line at the 3400-acre Thomas ranch took nearly two months, at the rate of 900 feet per day.

Vacuum Concrete Process Popular on Dam Projects

According to A. F. Bulger, executive vice-president of the Vacuum Concrete Corporation, Philadelphia, the firm's process for quick drying of concrete through a method of rapid extraction of water is now being used on three dams.

Mr. Bulger stated that the process is specified on nine other dam projects and that officials have reasonable assurance of contracts for 18 more.

Surprise! Products Firm Cuts Price of Blocks 10 Percent

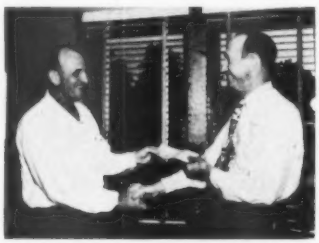
Happy smiles must have greeted an unusual announcement made recently by a Milwaukee, Wis., firm. Instead of revising prices *up*, Vander Heyden, Inc., quoted lower prices for Waylite blocks. The cut amounts to 10 percent.

Bernard A. Vander Heyden, vice-president and general manager of the concern, stated that one reason for the price reduction was to encourage the building of low-cost masonry-block homes. Since production methods have reduced operating costs, said Mr. Vander Heyden, his firm wishes to pass on the saving to the home builder. He acknowledged the part labor played in keeping costs down by continuing at established wage rates when the contract had expired.

Universal's Safety Slogan Prize Won by Columbus Man

First prize in the slogan contest sponsored for salesmen of the Universal Concrete Pipe Company, Columbus, O., was won by Earl Brane of Clarksburg, W. Va. T. H. Monaghan, Universal's general sales manager, announced Brane's winning slogan as: "North, South, East, West—Universal's pipe, best by test."

The $25 presentation was made by Earl Chidester, manager of Universal's Clarksburg plant. The contest was open to all salesmen in Universal's chain of 15 plants.



Earl Brane (right) receiving from Earl Chidester the $25 first prize for his winning slogan.

Cooksville Brick & Tile Suffers $500,000 Loss In Blaze at Big Plant

Early on the morning of August 16 a fire at the plant of the Cooksville Brick and Tile Co., Cooksville, Ontario, Canada, wiped out an acre of buildings and did $500,000 damage before it was brought under control. The largest plant of its kind in Canada, it had a capacity of 45,000,000 bricks annually and supplied most of the needs of Tronto and a wide area around that city. An acute shortage of bricks and a serious delay in many construction projects is expected.

The fire, starting in an overheated firebox, reduced 32 of 48 kilns to rubble, destroyed a new drill, damaged more than 2,000,000 bricks, and did other damage. Only a change in the wind direction prevented the fire from destroying the entire plant, including the company's adjoining haydite and concrete products operations and 100 employees' houses.

According to A. U. Cote, vice-president and general manager of the company, it will be months before the plant can be put back in operation and then at only one-third of capacity.

Dienhart, N.C.M.A. Directors Schedule Meetings in West

E. W. Dienhart, executive secretary of the National Concrete Masonry Association, and a number of the association's directors have scheduled meetings with local concrete masonry groups in the West, to be held on the following dates:

Minneapolis, October 3; Seattle, October 5 and 6; Portland, October 7; San Francisco, October 10 or 11; Salt Lake City, October 15.

Varied Line of Products Made at McCormack Plant

Along the Portland highway east of Hillsboro, Ore., the motorist will see great numbers of concrete pipe sections, some of them 60 inches in diameter, products of The McCormack Company, which also turns out concrete laundry trays and shingles.

Pipe ranging from 4 to 60 inches in diameter serve as irrigation and sewage conduits throughout a large area of the state. The firm also operates a laundry tray plant in Seattle and a clay brick and tile plant in Forest Grove, Ore.

At the Hillsboro plant the new project is the manufacture of nailless concrete shingles. Here the firm also turns out smooth-texture concrete colored laundry trays.

Pumsulite blocks are now being produced in Paola, Kan., in a plant owned and operated by P. C. Nicholas and his son, Carl. The first blocks were turned out in April with a plant rated at two blocks a minute.

Although extensively used on the West Coast for some time, Pumsulite is a new product in the Kansas area. Materials for the construction block come from New Mexico.

One day me and "Vinz" were working on a gear housing when one of the boys came up and complained that the kilns where he was mudding up some pipe fittings were too dark. Me and Vinz went back there and had a look. You know, they *were* dark. We never had paid them much attention and didn't think much about it. Well, we just put in a couple of larger bulbs and went on. Then Vinz got to thinking about what one of the light-and-power boys had told him about them having a department that would send out a man to talk to us about our lights and what effect it had on the efficiency of the men working in a plant. He called them up and in a few days the man came around to see us. He talked about candle power and reflections and all that stuff and about how little some improvements would cost to what we could get back out of them. We went all around everywhere and looked, and he looked, too. He had a little instrument that told how much light there was here and there and then told us how much we ought to have and how we could paint the walls and hang light-reflecting false ceilings over certain areas and what it would do for the men and what it would do for us. Sounded fine—fancy and sort of foolish to spend all that money for a lot of light when we were getting along pretty good as it was. We told him "thank you" and he left.

But it kept bothering Vinz. He didn't want to try to talk me into a big expense, he said, but could he just try it out in a few places? Well, we did. We started in the kilns by painting them all white with cement paint and putting in more and bigger bulbs. The place looked like daylight compared to what we had been working in. The boys liked it pretty good, too.

Well, then Vinz thought it would be a good idea if he had more light in his machine shop and in the general repair area. He hung some sheetrock on frames over the area about ten feet high and painted them white and fixed them so they would let down for cleaning and recoating in the future. It sure did make a lot of difference in how fast he could make his work come out of there.

Then we just started in on the whole plant and painted and lighted the place up everywhere. I couldn't put my fiinger on the thing, but something happened. Work came out faster, the men did things better; they had better tempers.

The man came back later to see how we were doing and to lend us some more help. I told him it was nice, but it had cost a lot of money. Then he got to figuring up how much it had cost. Well, I hadn't spent much after all; it just looked like it had cost a lot. I told him it cost money to keep all those lights going. He pointed out we were on an industrial rate and that actually I was saving money more ways than one on the little extra I spent on lights.

I doubted this; so he figured it out on paper before him just how much each bulb cost in juice per month and how much all of them cost over what I had been paying. Before he was all the way through that mess of arithmetic, I was sorry I had mentioned the cost. I could see it would run so little, I was going to look like a miser.

Then he got to easing around to my insurance on the men, and how much did it cost, and did I have any extra to pay because of any accidents in the plant. I knew I was sunk then, because we had had three pretty costly accidents right in those same kilns where all this lighting business got started. I was half mad at that guy because he made me admit that the lack of light was the cause of all three accidents, and that I had been the one that had been pinching pennies and lost dollars. You know, these book-taught guys sure can make you look bad sometimes. Well, anyhow I'm just a beginner and I'm not supposed to be smart.

$200,000 Aggregate Plant To Be Built by Smithwick

S. Carl Smithwick, president of the Smithwick Concrete Products, has announced that his firm will erect a $200,000 lightweight aggregate plant at Portland, Ore. The new plant, Mr. Smithwick stated, will be up-to-the-minute in modern design and equipment.

Product of the new facilities, which will be adjacent to the original plant, will be haydite, made from expanded shale. Mr. Smithwick stressed that fact that the haydite material is not expected to replace pumice entirely in the block industry; its major use will be in poured concrete.

W. J. Alexander recently assumed his new duties as sales manager of the Dallas, Tex., division of the Texcrete Company, which manufactures haydite masonry units. Mr. Alexander was formerly district dealer for Texcrete.

N.R.M.C.A. Members Get Copies of Public Law 177 On Overtime Issue

Members of the National Ready Mixed Concrete Association have been supplied with copies of Public Law 177, which eliminates the difficulties growing out of the so-called overtime-on-overtime decision of the Supreme Court in the Bay Ridge Case. It was the Senate version of the original H.R. 858 (amended) which was enacted into law.

Vincent P. Ahearn, executive secretary of N.R.M.C.A., announces that members of the association will soon receive new regulations dealing with this law, which will supersede those issued after the Bay Ridge decision.

Steel-Rice Pours and Pours— To Meet Demand for Concrete

Since its opening last May the Steel-Rice Ready Mix Concrete Company's plant at Owatonna, Minn., has poured thousands of yards of concrete in an effort to keep pace with the mounting local demand.

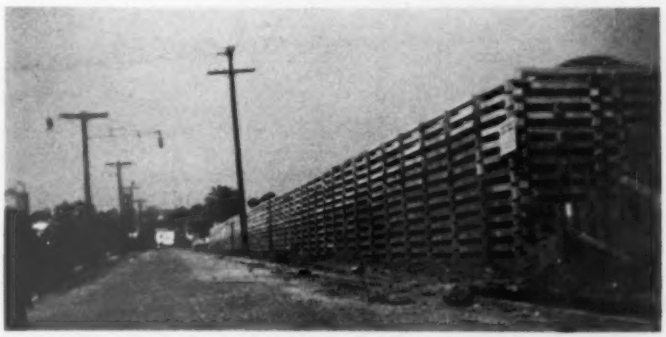
Three big transit-mix trucks deliver concrete to job sites. Maximum load of one of these trucks is 11,000 lbs.

Heading the new firm as president is Erv Hammel. Carl Dahlstrom is vice-president; Loren Luhman is secretary and general manager; and Louis Hammel and Paul Anhorn are directors.

Striking Truck Drivers Back on Job—with Pay Hike

On August 15 a 17-day strike staged by drivers of ready-mix concrete trucks in Granite City, Ill., ended when the men were granted a wage increase of 10 cents an hour. An agreement was reached between their employers, the Lybarger Construction Materials Company and the Granite City Supply Corporation, and representatives of the AFL Teamsters and Chauffeurs local 61.

The drivers had previously been offered a 5-cent increase, but sought a 20-cent hike. Provision was made in the new contract for a retroactive 5-cent hourly increase for the period between May 1 and July 26.



• Pictured above is the cribbing wall constructed for Our Lady of Sorrows High School at 227 North Lake Street, Los Angeles, Calif. 2400 precast concrete cribbing units went into the wall, products of Vly Vladimir of Glendale, Calif., whose crew also installed them.

California Style Roofing Starts New Industry in Washington

While visiting in southern California last winter, J. H. Laymon of Tonasket, Wash., was impressed by the remarkably large number of buildings in the San Bernardino area roofed with colorful, streamlined concrete tile.

Recently "retired" from the lumber business, Mr. Laymon was nevertheless planning to re-enter a new business of some sort upon his return to Tonasket. The production and application of this type of roofing appealed to him instantly and investigation led him to the plant of the Perma-Tile Concrete Prodcts Co. in San Bernardino. This concern had produced concrete roofing tiles by hand methods for many years but had just developed a new semi-automatic machine on which tiles were being manufactured much more rapidly and uniformly than had been possible by hand troweling. Too, the operation of the new Perma-Tile machine demanded no special skill of the operator and Mr. Laymon, trying his own hand at production, was surprised to discover that he, too, could make perfect tiles by simply manipulating the two controls of the machine. As commercial production of the equipment had just begun, Mr. Laymon placed his order for one of the first machines for delivery at Tonasket.

The accompanying pictures show the Laymon plant under construction in July of this year.

A Rex 6-cubic foot mixer was erected above the new Perma-Tile machine for easy discharge into the machine hopper. A power-operated skip will charge the mixer, permitting the sand and cement to be loaded into the skip bucket at ground level. Operations were started in August; and within a week's time, the average output was exceeding 300 tiles per hour. After overnight curing in a steam room, the units will be stripped from the pallets the following morning. The pallets will be oiled for resumption of production. Three men produce 10 or 11 squares per day, besides stripping and oiling the pallets and screening the sand, which is a little too coarse as it comes to the plant.

Acceptance of the product seemed to be assured even before the plant was erected. A local newspaper carried an article describing Mr. Laymon's new venture, and he had signed orders for the roofing of 15 residences as a result of this advance publicity and an exhibit of samples of the product he brought from San Bernardino. One of the first orders came all the way from Spokane . . . . 150 miles away! Public clamor for concrete roofs came as no surprise to Mr. Laymon, however. Up in the northern Washington timber country, the standard roof has, of course, been wood shingles. But the drawbacks—danger of fire, rot, and the necessity of frequent replacement—make people appreciate the advantages of permanent roofing such as Perma-Tile.

Permalited Steel Column Gets Three-Hour Rating

Great Lakes Carbon Corporation has announced that the Underwriters' Laboratories, Inc., have given a 3-hour rating to a steel column protected with "Permalite" plaster, 1-in. thick applied on metal lath as noted below.

The structural steel column used in the test to determine the rating consisted of a 49-lb., 10-in. square H-beam, approximately 9 ft. 3-in. long. Diamond-mesh metal lath (No. 24 USS gauge, 3.4-lb.) was used, furred from the steel column by metal lath spacers.

The plaster consisted of 3 cu. ft. of Permalite (perlite) plaster aggregate mixed with 100 lbs. of fibered gypsum, applied to fill the spaces between the lath and flanges of the steel column and pressed similarly through the lath at other locations. The plaster was applied 1-in. thick from the face of the lath, and finished with a 1/16-in. thick white coat.

Steel columns thus protected with metal lath and Permalite plaster were given a C-3 Fire-Retardant Classification, which is equal to a 3-hour rating. This classification is based on the apparatus and procedure outlined in ASTM Standard E-119 for structural steel columns.

First Alaska Products Plant In Operation at Anchorage

According to the *Forty-Ninth Star*, Anchorage (Alaska) journal, launching of the Alaska Concrete Products Company in that city was "another step toward self-sufficiency in Alaska".

Concrete pipe in sizes up to 42 in. and concrete block are the main items manufactured by this new concern. Owner of the plant is Carl B. Warren, who has operated similar plants in various cities in the United States and is now engaged in operations in Great Falls and Missoula, Mont., Spokane, Wash., and Salt Lake City, Utah. K. A. Sheppard is manager of the plant, which has a staff of 20 men.

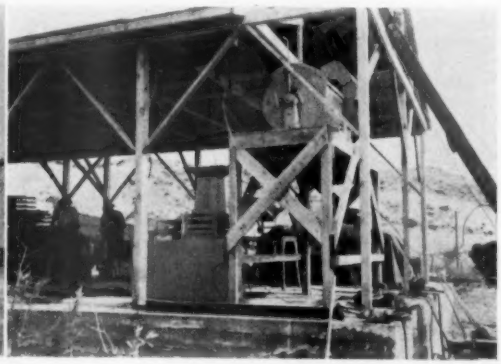
At present the plant is geared to produce nearly 2,000 tons of reinforced concrete culvert pipe for Anchorage's new airport construction.

N. C. Concrete Masonry Assn. Names Cannady President

J. F. Cannady, Henderson, N.C., was elected president of the North Carolina Concrete Masonry Association at the organization's summer convention on August 6. He succeeds L. J. Padgett of Mt. Airy.

Other officers chosen included Paul L. Barnes, vice-president, and H. J. Stockard Jr., executive secretary-treasurer (re-elected).

At Wagoner, Okla., a new industry, the Concrete Products Company, was recently launched by S. J. Wick and his son, both of Pryor, Okla. The Volcanic ash used in the production of lightweight blocks is obtained from large deposits in Wagoner County.



• Left, below: The Laymon Perma-Tile plant under construction at Tonasket, Wash. Skip loader is in the foreground.

• Right: A closeup of the plant, showing the roof tile machine, with the mixer above.

Stewart-Nattinger Does Good Design-Layout Job at Springfield, Mo., Plant

another ON THE SPOT report

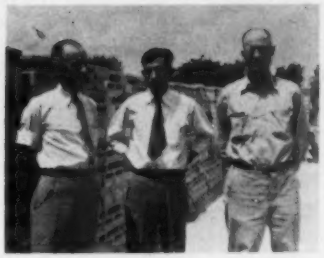
By WILLIAM M. AVERY

ONE of the most progressive concrete products firms we have called on during the past year or so is Stewart-Nattinger, Inc., of Springfield and Clinton, Mo. This company started in the block and ready-mixed concrete business at Clinton in 1943, and its facilities there grew, somewhat like Topsy, without a great deal of planning. When it was decided to build a concrete block and brick plant at Springfield four years later, the heads of the firm were determined that the new establishment should profit fully from the mistakes that were made in the Clinton plant. Although we haven't visited the latter plant, from our observations at Springfield we feel quite certain that they succeeded handsomely.

The plant is located on an excellent 3-acre site on the outskirts of the city, and the property has 380 ft. of railroad switch track on it. Equipment for batching, mixing and molding is housed in a separate 40- by 60-ft. Quonset structure located adjacent to the four rooms in which concrete masonry units are cured. Another 20- by 40-ft. structure houses the offices and the boiler room, and next to this (facing the machine building) is the 6- by 50-ft. Jackson & Church autoclave which is used for curing brick. A wide paved runway between these two groups of structures gives access to the extensive storage yard area.

Both Redi-Furred units and conventional concrete masonry units are produced on an F. C. George automatic hydraulic Press Pac block machine (360 units per hour), and a Jackson & Church CPB machine is used for brick production. These important pieces of equipment are located at one end (and on opposite sides) of the machine room. Each machine is served by a separate Dodson-McCord mixer located somewhat below floor level. An 18-cu. ft. model serves the brick machine, while the block machine is supplied by a 28-cu. ft. mixer. Between the two mixers there is a 43-ton, 3-compartment Construction Machinery aggregate bin with a monorail track from which a weigh hopper is suspended. The monorail is extended beyond the bins at both ends so that the batcher can be spotted over either mixer. The mixers discharge into Dodson-McCord skip hoists which supply the feed hoppers for the two machines.

About 20 percent of the plant output consists of lightweight haydite blocks, for which aggregate is shipped in by rail from the Carter-Waters plant near Kansas City. Crushed limestone and river sand are used for the remainder, and these materials are usually hauled in the company's own truck from the Ash Grove Lime & Cement plant located at Galloway, Mo., about 6 miles southeast of Springfield. Because of the ease and dependability of aggregate shipments, the bins, which are wholly within the machine room, are relatively small, having sufficient capacity to run the plant for about half a day. As a hedge against emergencies two or three truckloads of each size of aggregate are kept in storage outside the building, but no difficulty has so far been experienced in maintaining a steady flow of materials to the plant. Truck shipments are dumped from a short ramp, located at the rear of the machine building, into an open hopper. A bucket elevator lifts the material to a point above the bins from which it can be spouted to any one of the three compartments.



• Left to right: George Rhodius, sales manager; Lee Fisher, bookkeeper; and J. E. Stewart, who runs the Springfield plant.

The company uses standard portland cement in bags for all its productions. Up to two carloads can be stored in the main building. An incoming carload of cement is spotted on the rail siding opposite the paved runway, and the gap between the car and the runway is bridged with heavy planks. The bags are then loaded right in the car doorway onto 38- by 48-in. wood pallets consisting of 2- by 8-in. planks nailed to 4- by 4-in. sleepers. As each pallet is loaded (35 bags is standard loading) it is picked up with a lift truck and stored in the machine room. The loaded pallets are later spotted at the two mixers as required. Using this method, a 4-man crew can unload an 800-bag car in about 1¾ hours.

For making concrete masonry units this company uses a mixture consisting of 40 percent $\frac{5}{8}$-in. chats and 60 percent fine stone sand ($\frac{1}{8}$-in. to 100-mesh). For making brick

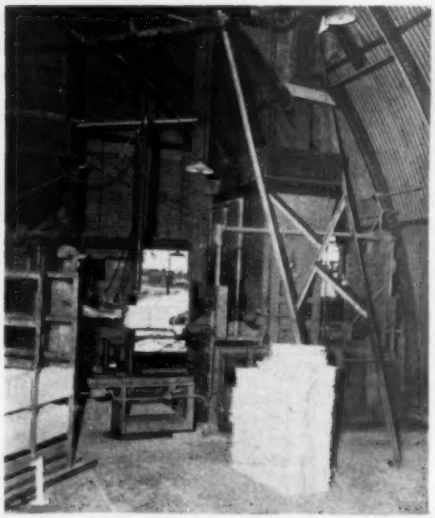
• A general view of the Springfield, Mo., concrete products plant of Stewart-Nattinger, Inc. Machines are housed in the Quonset structure at the right. The autoclave at the left is for curing brick.

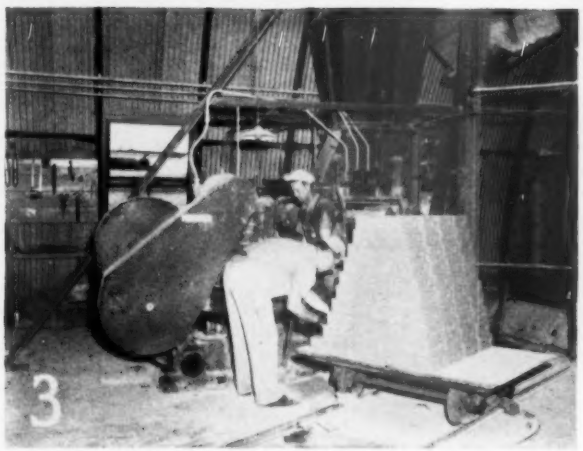
the proportions are ⅓ sand (either stone sand or river sand) and ⅔ agstone (⅛-in. to 200-mesh). The two trade names under which the products are marketed—Agstone Brick and Agcrete Block—were derived from the materials used. On block the yield is approximately 20 8-in. equivalents per sack, and on brick about 1000 units to 6 sacks of cement.

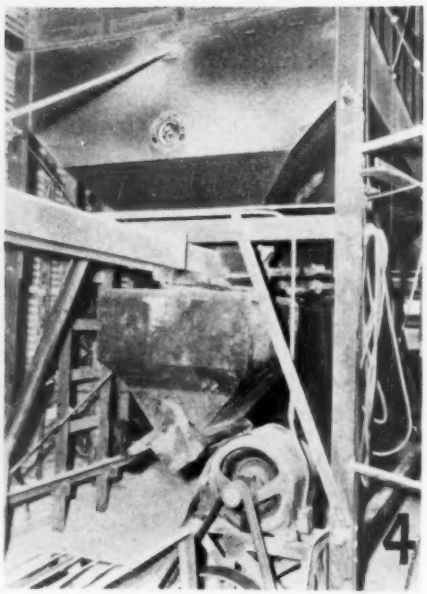
An interesting aspect of the mixing setup is the method used for adding water. An ordinary domestic hot water heater, equipped with a glass gauge, is located next to each mixer. When the optimum water requirement for a particular mix design has been determined, a marker on the glass gauge is set to indicate this amount, and the tank is filled to the level of the marker. When the valve is opened, the desired amount of water flows by gravity into the mixer. Since all the materials are usually dry when they reach the plant, it is seldom necessary to change the adjustment, once the proper amount of water has been determined by trial.

It was pointed out to us that one of the best features of this method of introducing water is that the flow into the mixer is very slow. It takes 3 or 4 minutes of the total 10 minute mixing period for the water to flow from the tank through the drilled pipe over the mixer. This gradual introduction of water keeps the fine materials from balling, and is said to result in much better mixing. In addition to the valve which controls the flow into the mixer, there is a second valve which can be used to bleed the tank in the event it is overfilled.

There are four 7- by 52-ft. rooms for curing block, each with a capacity of 1,000 units. The high pressure Jackson & Church autoclave for curing brick is 6 ft. in diameter







1. Redi-Furred and standard concrete masonry units are produced on this automatic hydraulic machine.

2. An interior view of the machine room shows the block machine at right, the brick machine at the left and the three-compartment aggregate bin in the center.

3. A view of the high-production machine which makes concrete brick. A flat-bed car, which is handled with a fork truck, holds 800 units.

4. Aggregates from the 43-ton bin flow by gravity into a monorail-suspended hatching hopper. The monorail extends out over the two mixers.

and 50 ft. long. It holds 12,000 bricks, or about a full day's production. All the kilns are charged with an Erickson 6000-lb. gasoline-powered fork lift truck, using conventional 60-unit steelracks for block and small rail cars, holding 800 units each, for brick.

A 100-hp. all-automatic Broderick oil-fired boiler supplies steam for both low- and high-pressure curing. The full 100-lb. pressure is piped to the autoclave, while reducing valves cut the pressure to the block kilns to about 15 lbs. The autoclave is brought up to maximum temperature (about 337 deg. F.) in 4 hours, held at this level for 8 hours, and then is bled down in about 3½ hours. The block curing cycle allows about 2½ hours of initial setting time before steam is admitted to the kilns, followed by a "steam on" period of 8 hours during which the temperature is brought up to 180 to 200 deg. F. A 5½-hour soaking period completes the cycle.

All blocks are assembled into 45-unit cubes at the time the curing racks are unloaded in the storage yard. The cubes are handled by running the forks of the lift truck through the cores of the bottom course of units. This method of operation was found to reduce handling costs by at least a third, as compared with other methods.

Normally the brick machine and the block machine are operated alternately, although both units can, if necessary, run at the same time. Six men are required for the day shift, which consists of a full 8 hours of production. A night man takes care of clean-up work and lubrication. Since this man is an expert mechanic, small faults with the equipment are discovered and corrected before they can interfere with production.

The company has done an outstandingly good job of promotion and advertising to create the widest possible market for its products. In addition to a regular program of newspaper advertising and two sizable insertions in the classified section of the Springfield telephone directory, during 6 months of the year time is purchased on a 15-minute radio program called the Morning Time Clock. Many orders can be traced directly to this source.

Good use is also made of attractive on-the-job signs calling attention to the use being made of Ag-

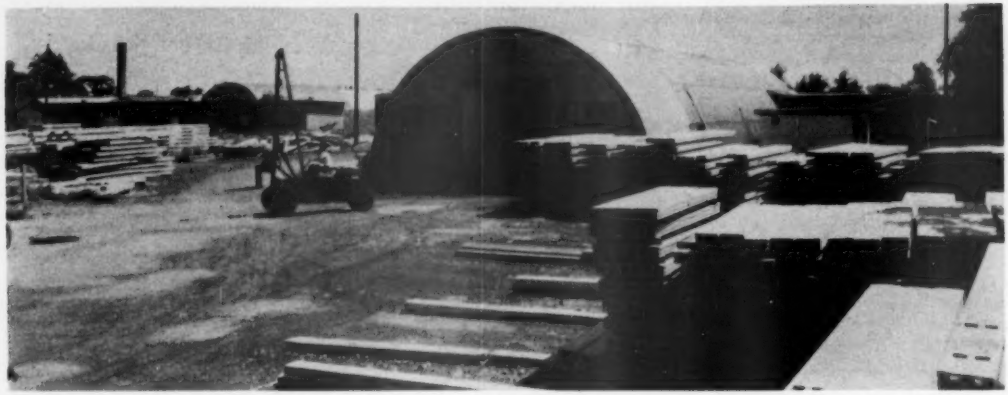
(*Continued on page* 136.)

• Charging the 6- by 50-ft. autoclave with the 6000-lb. gasoline-powered fork lift truck. The building in the background houses the boiler and offices.

• An example of the company's use of on-the-job signs to call attention to its products.

• An attractive company display at a recent industrial exhibit. Heads of the firm state very definitely that this sort of promotional spade work pays off.

Alert Sales Program Keeps Plant Operating at Peak Capacity



• The yard and buildings of the Flexicore plant operated and owned by Mid-States Concrete Products of South Beloit, Ill.

another ON THE SPOT feature

THE Flexicore franchise of the Mid-States Concrete Products Co., South Beloit, Ill., includes the territory encompassed by the southern half of Wisconsin and the northern counties of Illinois. Although it is true that the production facilities of this plant are modest when compared to some of the larger Flexicore licensees, the promotion and marketing techniques pushed by Mid-States are outstanding in an industry generally apathetic to a planned and consistent merchandising effort.

By EDWARD BRUNENKANT

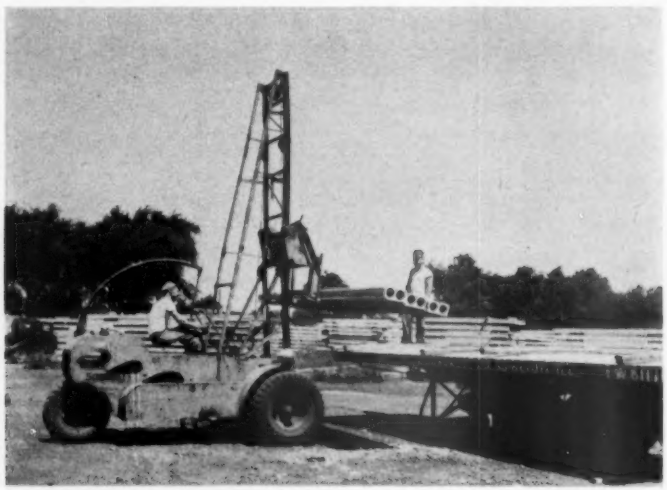
For example, the company has a 30-minute sound film, produced at a cost exceding $3500, which is shown to any interested group including schools, rotary clubs, meetings of architects and engineers, and many others. It shows the production end of making Flexicore roof and floor slabs, as well as installation shots. In addition to the sound film, the company showers architects and engineers with pamphlets and brochures describing the applications and advantages of Flexicore construction. Some of this material was prepared by the advertising staff of Price Bros. Co. of Dayton, O., originator and licensor of Flexicore, and is available to all Flexicore manufacturers, while other pamphlets were prepared by Mid-States.

In an effort to sell the booming farm construction market, the company, in cooperation with other concrete products manufacturers, erected a mock barn at the Wisconsin State Fair. Mid-States supplied the slabs for the haymow floor. Interest in this exhibit was so keen that it is likely to be continued each year.

Although Dodge Building Report service is considered an indispensable tool among construction industries, Mid-States was the first concrete manufacturer we have visited that has put this service to work. Dodge reports on all construction jobs within any specified area, giving the type of construction, the cost, the architect, and other pertinent information. (See illustration.) With such a complete and alert sales program, it is no wonder that the modest plant is operating at full tilt.

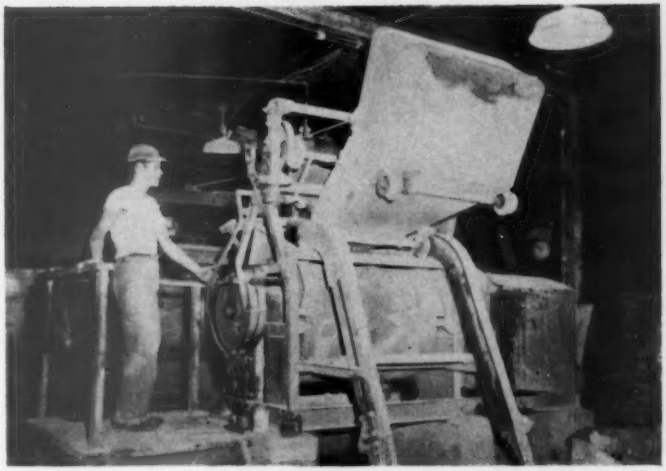
Although the principals of this organization, Charles and George Harker, brothers, started the business in 1938, it was closed during the war. In 1946, the plant was reopened under the name of Mid-States Concrete Products Co.

The present plant is housed in a large Quonset-hut type building. All the aggregates are trucked in



• Equipped with a 14-ft. high lift, this machine easily loads three Flexicore slabs onto a flat-bed truck.

• This concrete mixer is charged by hand. Normally a 1:2:3 mix is used.



from the Consumers Company's yard across the road. With the supply of raw materials so close, there is little need for big stockpiles.

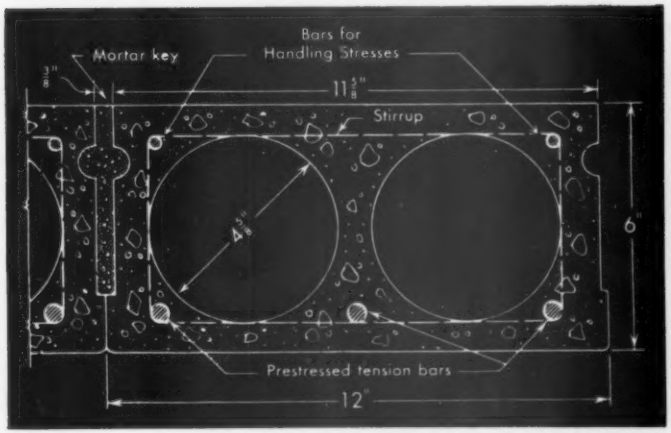
A 10-S Construction Machinery Co. concrete mixer is charged by hand using a 1:2:3 mix design with hi-early cement, which is handled in bags. The concrete is shoveled into the assembled form, which is laid on top of three piers equipped with Syntron electric vibrators. These piers are aligned in front of the kiln so that after compaction of the concrete the slabs can be easily lifted, stacked and pushed into the curing room. The green units are stacked in tiers of six, the bottom slab resting on roller conveyor tracks laid longitudinally in the curing room.

When fully loaded, a curing room will accommodate 100 forms. In this plant there are two curing rooms, both equipped for steam curing. During the colder months, when steam curing is necessary, live steam is turned on for a 24-hr. period at temperatures ranging between 95 and 100 deg. F. In the summer a water cure is sufficient. All units, irrespective of the type of curing, are yard-cured for a period of not less than three weeks. The patented Flexicore tubes which form the two hollow cores in the slab are deflated and pulled as soon as the concrete has set.

The cured slabs are lifted from the curing rooms with a one-ton placed on a roller conveyor for strip- Budgit overhead electric hoist and

(*Continued on page* 136.)

• Stripping the form from a freshly-cured Flexicore slab. The rubber tubes that formed the cores in the center of the slab were pulled several hours before this photo was taken.



• A sectional view of a Flexicore slab. The cores are formed with a patented rubber tube which is withdrawn after the initial set.

• The bottom plate of the firm is carefully cleaned with a portable wheel. This is necessary, since Flexicore is frequently sold on the merit of its smooth bottom surface, which makes an attractive ceiling which needs no plastering.

Basalt Rock Adds Strestcrete Slabs To Its Variety of Concrete Products

another ON THE SPOT report

THE Basalt Rock Company, Inc., Napa, Calif., is one of the nation's leading producers of concrete units, both in point of volume as well as variety of products. The main "Basalite" plant at Napa turns

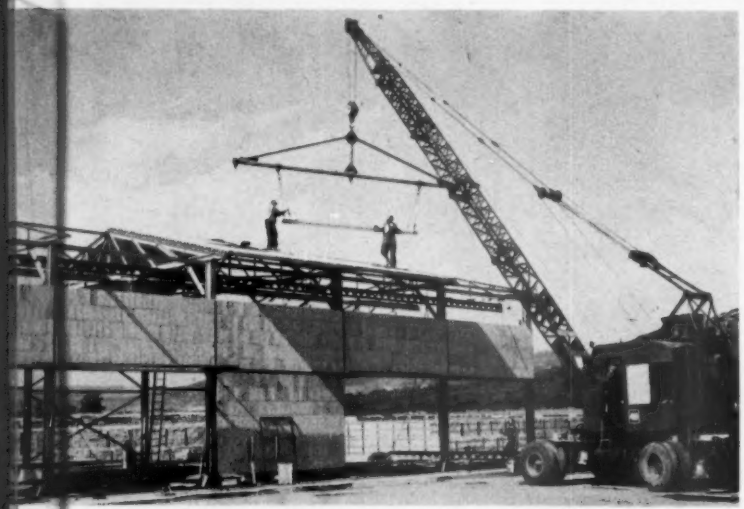
By HARRY F. UTLEY

out some 125 sizes and shapes of individual masonry units on three Besser Supervibrapac machines. Cambered concrete shingles are also manufactured on special machinery which was imported from England. Another plant, almost the equivalent in size, turns out blocks and concrete pipe at Stockton, while several lesser plants in strategic locations throughout California supplement the output of the big plants in Napa and Stockton.

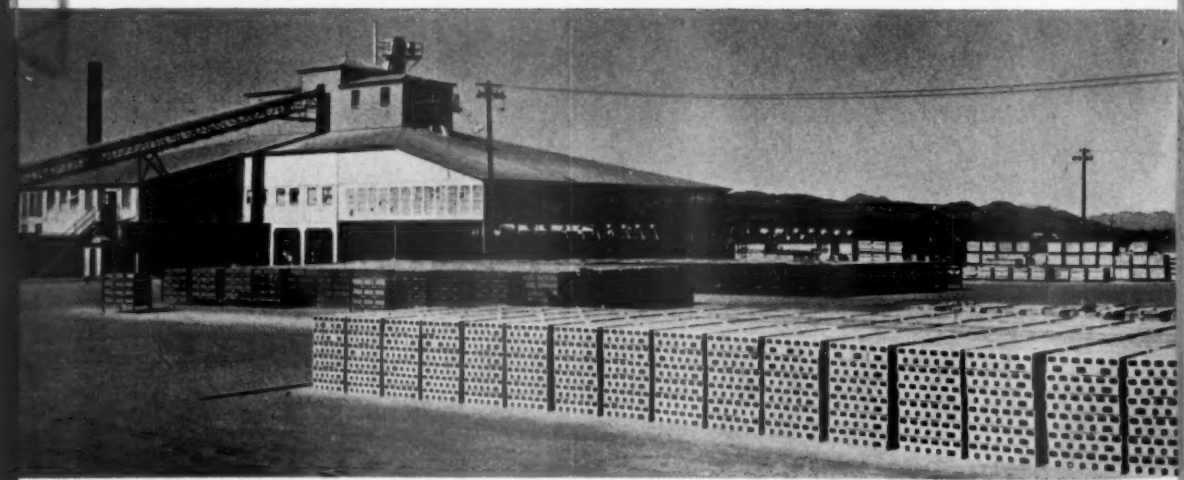
For some time Basalt Rock's president, A. G. Streblow, and D. O. McCall, chief engineer, have worked experimentally on a floor, roof and wall-slab system utilizing lightweight concrete blocks. "Perfection" was ultimately achieved less than a year ago. Known as "Strestcrete" (coined from "pre*stressed* con*crete*"), the development has been hailed by West Coast architects and engineers for the speed and economy it offers in a wide variety of permanent structures. A number of important concrete products manufacturers in the East, Middle West, and South have also gone into Strestcrete production recently as licensees of the parent concern.

In Strestcrete, the contacting edges of the units are precision ground and the units are secured together with prestressed steel bars positioned into grooves cast into the units at the time of manufacture. The smooth under-surface eliminates the need for finishing, providing a ceiling ready for painting or the application of a thin layer of plaster. As the sections are laid, with the minimum of grouting, the next story (on multi-storied buildings) may be begun immediately.

Visitors to the Napa plant recently witnessed the erection of Strestcrete roof slabs and Strestcrete



• Left: Scene at the site of roof slab and wall panel installation, at which Strestcrete roof slabs and tongue-and-groove siding were put in place with a long-boom crane.



• Below: A general view of the Basalite plant and storage yard at Napa, Calif., first plant of the Basalt Rock Company.

tongue-and-groove siding which was attached to the steel framework of a building 40 ft. wide, 100 ft. long and 22 ft. high to the eaves. Steel trusses were 40 ft. long and spaced 16 ft. apart. The slabs were attached to the steel framing by welding. No purlins were used, and the 16-ft. spans were open from truss to truss. The slabs were raised and laid in place by a Link-Belt Speeder crane.

The rate at which the floor slabs were laid indicated that a trained crew could place 5,000 sq. ft. of slab in 8 hours. End washers of steel are used at both ends of the slabs and the steel is stressed against these washers. This made it possible to weld the concrete panels to the steel frame with a positive type of connection to give the entire structure extreme rigidity.

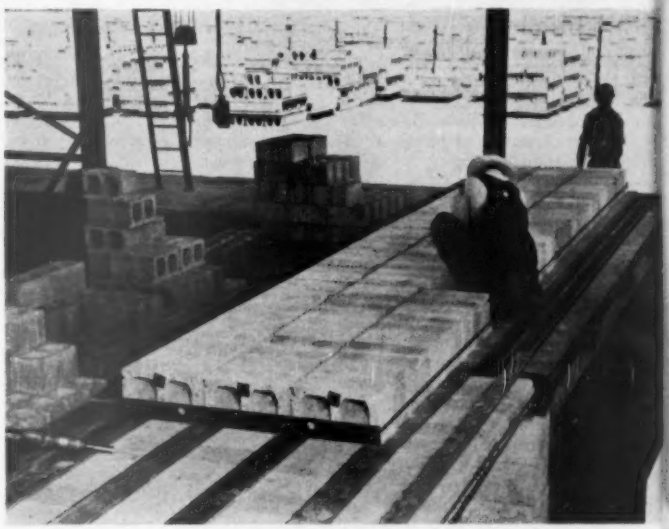
At the same time, erection of Strestcrete tongue-and-groove wall was demonstrated. This consisted of slabs 110 sq. ft. in area, similar in assembly to the roof slabs. The wall panels were 16 ft. long and 6 ft. 8 in. high. The rapidity with which the panels were erected was little short of amazing.

The building itself was no idle experiment. The structure is now a permanent part of the Basalite plant and houses the special tables and jigs for assembling Strestcrete, as well as a rod-straightening unit. The latter allows the purchase of reinforcing steel in coils for economy and convenience. Cut-off and threading equipment also aids in the elimination of waste time and speeds assembly.

Bend and shear tests were also conducted as part of an intensive program being carried out by the structural-engineering firm of Hugh M. O'Neil Co., Oakland, Calif. The tests have conclusively demonstrated that prestressing almost eliminates deflection under load, keeping tension cracking at a minimum, and that factors of safety for shear and bending are well above those required by accepted practice.

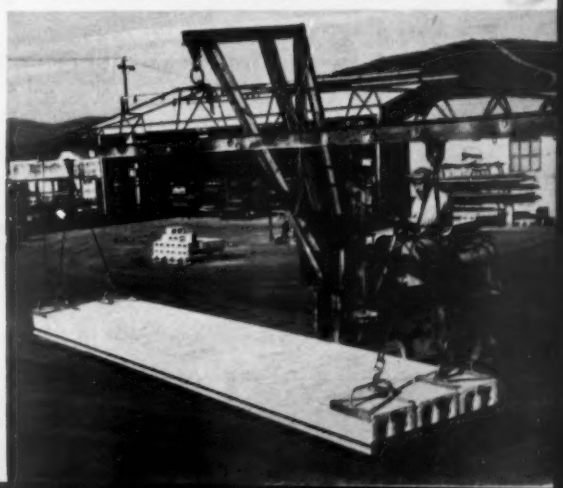
At the Napa plant the units are formed in special mold boxes on the Vibrapac machines. After thorough curing, the contact edges are smoothly ground in a special precision grinding machine designed and built by the company. The machine grinds both edges simultaneously and in perfectly parallel planes. A suction fan and cyclone collector makes the operation practically dust-free. The ground units are next assembled on a make-up table in a horizontal position and brought into compression with the threaded tension rods fitted into the lined-up preformed grooves.

• Here the Strestcrete grinder is grinding both edges of a silo unit at once.

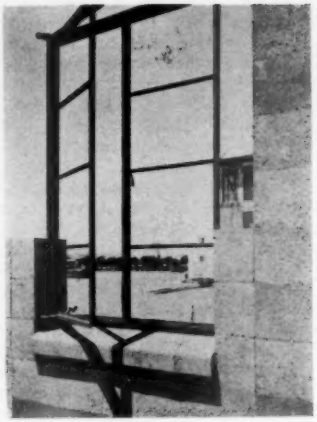


• This workman is assembling a Strestcrete slab to provide an opening for a chimney.

• Below, left: After the threaded tension rods have been fitted into the grooves, tension is accurately measured with a torque wrench.



• Below, right: A lift truck and a special handling boom and grapple hooks are used to handle a newly-assembled slab.



• A closeup of a Strestcrete wall and window assembly.

• Left: Piles of finished tongue-and-groove wall panels in the yard.

Tension is accurately measured with torque wrenches. The slabs may then be handled in any manner and are ready for installation on the job.

Strestcrete slabs and panels in various thicknesses from 3 to 12 in. are assembled in widths to 8 ft. For roof construction, slabs that span 32 ft. have been proved safe and practical. The company, of late, has been developing special curved panels for the quick assembly of permanent silos, tanks, etc. Diameters are from 12 to 18 ft. Silos can be erected to any practical height.

The lightweight aggregate used at Napa is pumice, obtained from a company-owned deposit only 3 miles away. It is crushed, screened, and washed at the Basalite plant.

Alert Sales Program

(*From page* 133)

ping of the forms. The forms are stripped, cleaned, oiled, and reassembled on an assembly-line basis. All this work is done as a continuous operation, the forms never leaving the roller conveyors, which wind around the plant from the discharge end of the curing room to a point near the vibrating piers. An interesting innovation in this assembly process is the wire cutter—a Dore Mfg. Co. Wire-Matic—a machine which automatically straightens and cuts to proper lengths the wire used for Flexicore cages.

Like other Flexicore manufacturers, Mid-States produces slabs only on specific order. In 1947, working on a year-round basis, the company produced and sold in excess of 1,000,000 sq. ft. of roof and floor slabs.

Due to the cored structure of Flexicore slabs, a growing number of architects are designing buildings using these units as an integral part of the radiant heating system. By utilizing the cores as heating ducts, Flexicore is said to save considerable pipe work, heretofore necessary in systems of this type. The Harker brothers, realizing the popular demand for radiant heating systems, have pushed the sales of their product on the strength of economy inherent in the easy adaption of Flexicore slabs to this purpose.

• Mid-States uses these Dodge Building Reports to keep abreast with current construction jobs.

DODGE REPORTS

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Home Owners' Catalog
Sweets Catalog Files
Architectural Record
Real Estate Record
Building Statistics

JUNE 3 1948- 2 CHGO 12# 582 352

PLANS NEARING COMPLETION-WILL BE READY FOR BIDS ABT JUNE 15TH
RESIDENCE (SALE) $ 35,000
MILWAUKEE CO WISC (TOWN OF MILWAUKEE)
OWNER - WITHHELD C/O ARCHT
ARCHT - ALBERT STERNKOPF 7111 MAPLE TERRACE WAUWATOSA WISC
FRAME & STONE VENEER - 1 STY & BASE 83x47
INCLS 8 RMS WITH BATH - 2 CAR ATT GARAGE
ASPH SHGLS RFG WARM AIR HTG OIL FIRED OAK & ASPHALT TILE FLRG LINO WOOD SASH GALV IRON SHEET METAL WOOL INSULATION CONCR BLK FDN

Stewart-Nattinger

(*From page* 131)

crete Redi-Furred block and Agstone brick.

Stewart-Nattinger plays an important part in the activities of a local block manufacturers' association composed of about 25 firms all located within a radius of 150 miles of Springfield. An opportunity to exchange experience and discuss mutual problems is provided by regular monthly dinner meetings.

The company's Springfield plant is operated by J. E. Stewart, and the plant at Clinton is run by O. R. Nattinger. In addition to block and ready-mixed concrete the Clinton plant also produces coping, lintels, sills, water tanks and similar precast concrete products. Marvin Reid is secretary-treasurer of the company, and George Rodius is sales manager for the Springfield area.

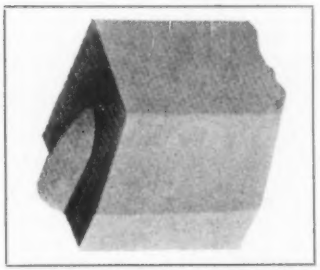
Manufacturing Precast Concrete Curbs Is Vital Part of Dutch Concrete Industry

PRODUCTION of precast concrete curbs plays a highly important role in the Dutch concrete industries. In 1947, for example, more than 200 miles or standard-types of concrete curbing were made and sold in The Netherlands. This figure, however, does not include the undoubtedly large amounts of other non-standard types which were made but not totaled in the official Dutch statistics.

Most of the Dutch curbs are manufactured in two standard sections, a rectangular section, used in roads, and a battered section, which is more frequently called a sidewalk curb. In the latter type the batter is always 4¾ in. high. It is also covered with an abrasion-resistant surface mix similar to that used to top the rectangular curb. Both types of curbs are also made in an L-shaped section.

Since the wearing surface frequently must withstand the abrasive action of traffic plus impacts when wheels collide with the curb, the exposed area is often coated with special aggregates like carborundum, steel slag, basalt, or hard rocks like granite.

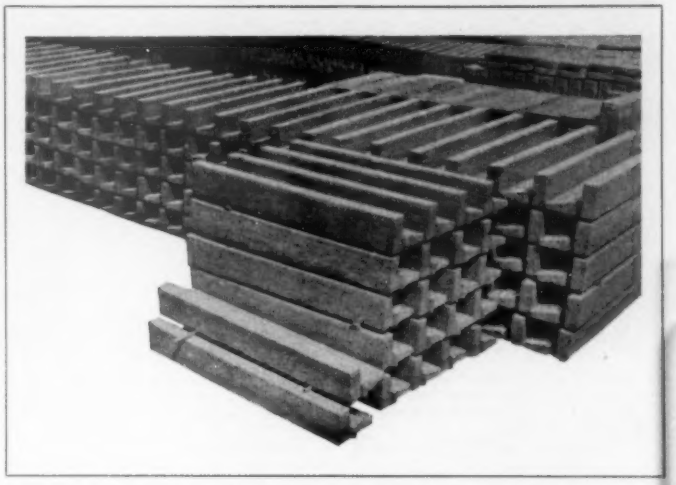
The exposed areas of the battered



• A portion of a battered curb, showing a half-round joint. The joint ends about 2 in. from the top of the curb, so that when joined the top will appear smooth and continuous.

or sidewalk curbs are frequently used as traffic markers with the exposed surface colored either black, yellow or white. In residential gardens or on driveways to private garages red curbs or planks (small reinforced curbs with a width from 1¼ in. to 2 in.) are used.

Curbs are generally made in 1-meter lengths (nearly 40 in.) and are unreinforced except for special purposes. Longer lengths from 1½ to



• Rectangular-shaped curbs (also the battered-shape) are frequently made in L-shaped sections.

2 meters are usually reinforced with steel bars. For a list of standard dimensions of Dutch curbs with respective minimum breaking strength see the chart below.

Dimensions	Class Breaking Strength in Pounds A	B	C
5¼/6x10"	5280	8800	12100
7¼/8x9⅝"	6380	10560	14960
5¼/6x12"	7480	11440	17380
4¾x12"	5490	9000	13860
4¾x100"	4280	7040	9680
4x8"	2200	3740	5280
2⅜x8"	2200	3080	3960

(Dimensions given as 5¼/6x10" means 5¼" width at the top, 6" wide below the batter and 10" height of curb.)

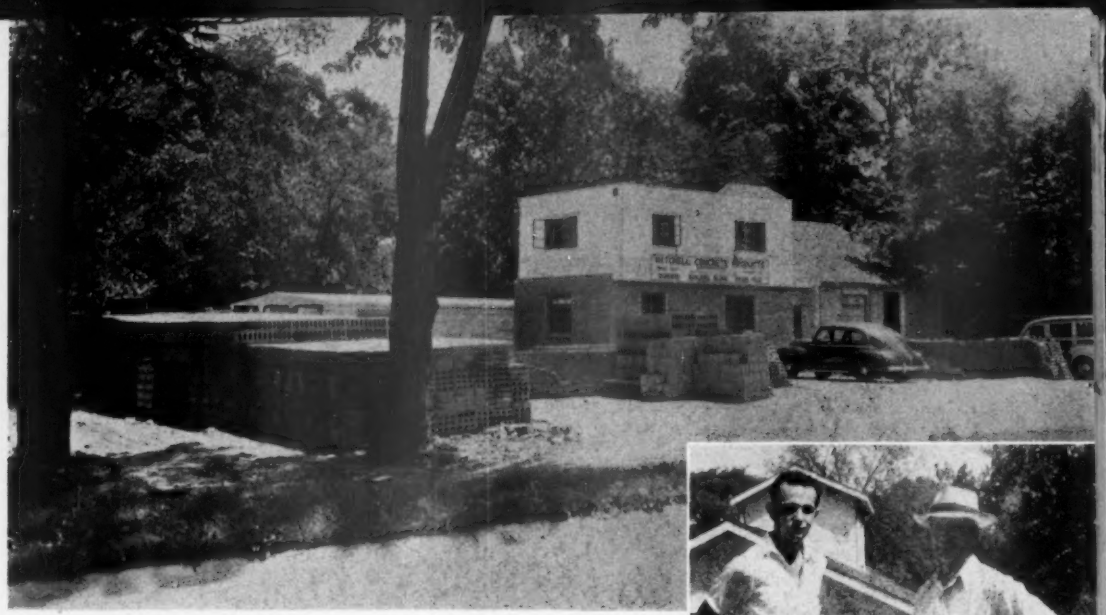
The strength of the curbs were tested by placing a unit on two 2-in. rolls spaced at 80 centimeters apart. The pressure was applied by a hydraulic press through a third 2-in. roll on top of the curb positioned above and between the two other rolls.

Most of the curbs are formed in steel molds. Unreinforced units are tamped by hand, air, or electric tampers and sometimes, although not usually, vibrated. Reinforced curbs are made with a dry mix and are always vibrated. As soon as the concrete is compacted, the molds are stripped.

The curbs are joined together with a variety of types of joints. Generally the joints run from bottom to top in order to facilitate the withdrawal of damaged curbs without disturbing the two adjacent units. A hidden joint (ending approximately two inches below the top of the curb) is preferred because the effect is that of an unbroken surface. Joints are made in a half round, V, or streamlined V shape. A special patented joint is a Samson joint, which utilizes two concrete balls as the male member, which fit in two holes in both ends of the adjacent curb. This union allows some movement without damage to the top of the curb. Radius curbs are made in plywood molds with radii from 1 to 125 ft.

Sidewalks or battered curbs generally have a slope of from 1 to 30 at the back for drainage of rainwater. The tops of these curbs also have a slope of 1 to 30, the slope inclining toward the battered side.

All types of curbs are usually produced indoors on concrete floors. To facilitate handling, the curbs are sometimes placed on pallets. After wet curing for one or two days the green curbs are stored outdoors and kept wet for an additional 7 or more days.



• Above: A general view of the Mitchell Concrete Products plant, located near Mahomet, Ill. The head of the firm and his family live in an apartment over the plant office building. • Right: Robert D. Mitchell and his father, Roy Mitchell, are respectively president and vice-president of the company.

Block, Brick and Drain Tile Build Market for Small Products Plant

By WILLIAM M. AVERY

another ON THE SPOT report

THE important influence of the farm market on the current development of the concrete products industry is indicated by the establishment in recent years of a number of well designed and highly efficient plants in (or near) very small communities which could not possibly support such enterprises by themselves. Some months ago we noted an excellent example of this when we visited the plant of Mitchell Concrete Products, Inc., at Mahomet, Ill.

Although the population of Mahomet is under 1,000, the town is located in a prosperous farming area. This circumstance, combined with the proximity of several other small communities, encouraged the company's organizers to believe that an adequate market could be developed for the output of a moderate-size concrete products plant.

The plant is located on an attractive 20-acre wooded site on the Sangamon River about half a mile south of the town. Full advantage was taken of the natural ground elevation by building the aggregate bins into the side of a hill at one end of the property. The two bins are of concrete construction and each has a capacity of 60 cu. yds. An access road from the paved highway on which the plant faces permits trucks to dump directly into the bins without intermediate elevating. The aggregates are supplied by a washing and screening plant located only two miles away. Two sizes are used—minus 3/8-in. for block and minus 1/8-in. for brick. Bagged cement is used exclusively, and there is storage space available for two full carloads.

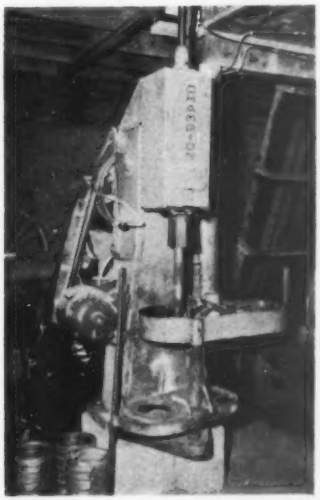
Although the materials are batched by volume, a close check is kept on the moisture content of the aggregate, and appropriate changes are made from time to time in the amount of water metered into the batches. The mixing is accomplished in a 16-cu. ft. Dunn mixer. This is

• Separate machines for making brick and block are located side by side under the mixing balcony.

• By utilizing the natural two-level site, material trucks can dump directly into the concrete storage bins. The bins are hinged at the top.

located on a balcony over the molding machines, and it is charged by means of a skip hoist. The materials are mixed dry for about three minutes, followed by a four-minute mixing period after the water has been introduced.

The plant is equipped with three separate Dunn machines for producing masonry units, brick, and farm tile. By diversifying output to this extent it was felt that a much wider market could be developed than would be possible if the plant were equipped to produce only masonry units. The three molding units are a Corpac block machine for making standard masonry units, a Dunbrik machine, and a Champion drain tile machine.



• The machine pictured above is used for making 6- and 8-in. farm drain tile in one-foot lengths. From 800 to 1,000 can be produced in an 8-hour shift.

Since there is only one mixer, only one machine can be operated at any given time. Normally production time is divided between the brick machine and the block machine, drain tile being produced mainly during the slack winter months.

In a 9-hour shift the Corpac machine produces about 1400 8-in. equivalents, but racks and pallets are available for a daily output of around 2,200 units. Production on the brick machines averages about 1,500 units per hour, and there are enough pallets on hand for 6,600 units or about 4½ hours' running time. Six- and 8-in. farm drain tile in 1-ft. lengths can be produced at the rate of 800 to 1,000 in an 8-hour shift.

There are three curing rooms about 8 ft. wide by 44 ft. long. Curing is done with live steam generated by a 30-hp. oil-fired water tube boiler. After the rooms are closed, the temperature is brought up to 180 deg. F. as quickly as possible, and held at that level for about 6 hours. Then the steam is cut off and the units are allowed to soak until curing space is needed for the next shift's operations.

Curing racks are handled with Barett-Cravens hand lift trucks. The rooms open onto the machine floor at one end, and onto the storage yard at the opposite end. Steam is introduced through petcocks located at 5-ft. intervals on both sides of the rooms just above the floor.

When the plant is operating on a one-shift basis, three men are employed in the machine room and one in the storage yard. Two-shift operations (often necessary) require a 5-man crew during the day, but only three men on the night shift.

To help in introducing concrete brick into the area, the company

• The 16-cu. ft. mixer, on a balcony over the molding machine, is charged by means of a skip hoist.

produces these units in several colors, using oxide coloring purchased through the W. E. Dunn Manufacturing Co. So far the farm market has accounted for about 30 percent of the output of all types of units. Although nearby material dealers are used as outlets, most of the business so far has originated through local contractors.

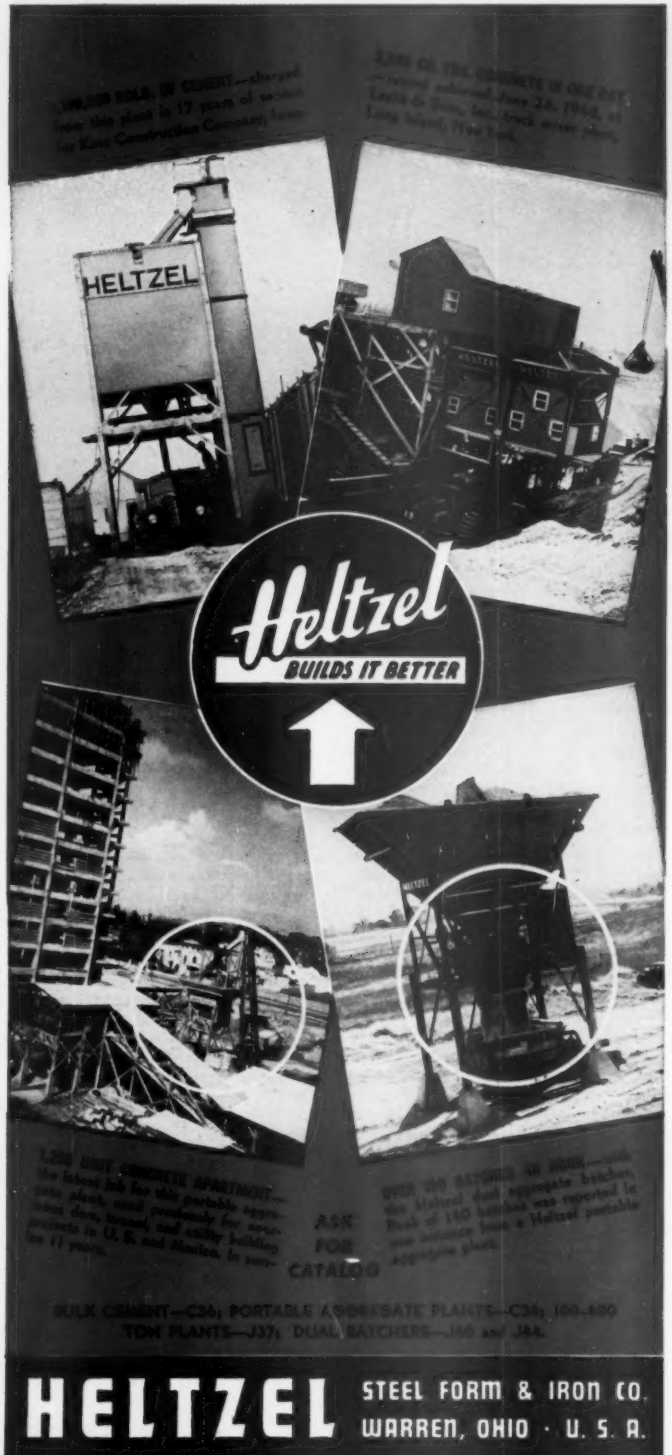
The Mitchell plant has been in continuous production since August, 1947. Robert D. Mitchell is president of the company, Roy Mitchell, serves as vice-president.

Lightweight Block Produced By New Oklahoma Concern

The Concrete Products Co., a new firm in Wagoner, Okla., is now engaged in the production of concrete blocks and ready-mixed concrete. Owned by S. J. Wick and his son, the plant already is turning out lightweight building blocks of volcanic ash. Wagoner County is said to be one of the few counties in Oklahoma with large deposits of the material.

A new steam room, which is being built adjoining the concrete company, will eliminate the manpower necessary in processing the blocks with water and will step up the hourly output.

Robert H. Kriebel was recently appointd to the sales staff of the Graystone Concrete Products Company of Seattle, Wash. After serving in the United States Navy during World War II, Mr. Kriebel was associated with the Thor Corporation. In his new post he will specialize in sales of Peerless cement paint.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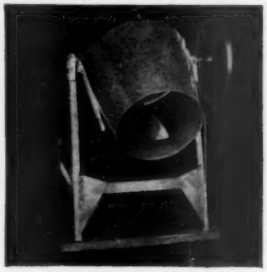
NEW MACHINERY and SUPPLIES

● Portable Mixer

A new lightweight (147-lb.) portable concrete mixer has recently been announced by the Denver Equipment Company, Denver, Colo. This unit is

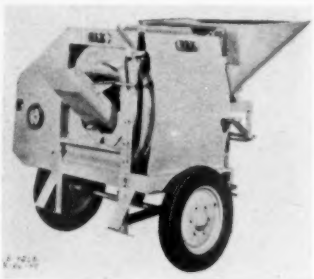


available with either hand drive or electric or gasoline engine power. It is mounted on hardwood skids; a pneumatic-tired trailer is available. Capacity of the mixer is 3 cubic feet wet mix per batch. Mixing time is less than 2 minutes.

The mixer can be disassembled for pack-train transportation to inaccessible locations, as the heaviest part weighs only 74 lbs. Rugged construction employs the use of aluminum alloy and steel. Denver Equipment Company, 1408 17th Street, Denver 17, Colo.

● Redesigned Mixer

Chain Belt Cmpany of Milwaukee, Wis., announces the new Rex 3½ S skipper mixer. Completely redesigned, this new mixer is said to give 50 percent



greater production than the 3½ S tilter type mixer.

Many exclusive Rex features are present in this mixer—such as the Rex pivoted hopper and the Rex stationary charging gate. The latter feature permits loading the hopper while another batch is in the drum; it is mounted above the center line of the drum, free from the spatter of mixing concrete. The Rex

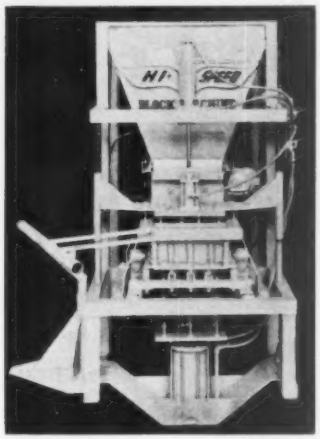
water system, Rex chain drum drive, Rex discharge chute, and Rex towing are additional features.

Easy operating, grouped controls add to the efficiency of this mixer. The skip lever acts as a skip shaker arm to get the batch into the drum fast. Concrete cannot build up in the skip throat.

● Block Equipment

J. W. Appley & Son, Inc., St. Petersburg, Fla., have expanded their facilities, in connection with the Miami Shipbuilding Corp., and are presenting the Appley-Yellen two-block machine, with forming head.

This machine is furnished either completely automatic on semi-automatic. The automatic machine functions in a



complete cycle of 4 to 20 seconds in which all operations are controlled. Thus, when the proper aggregate has been selected, the amount of vibration determined, etc., each operation is uniform.

The capacity of the automatic type is 4000 to 4500 8- by 8- by 16-inch blocks per day. Normal output of the semi-automatic is between 3500 and 4000 blocks per day.

This machine is equipped to make standard and special blocks with merely a change of cores and head plates.

This company also is bringing out the "Power Ejector" applied to the Appley "Little Giant" machine, which features ejection on a pre-determined cycle (entirely automatic) and which stops automatically at the end of each cycle.

A 28-cu. ft. mixer, using a 15-h.p. motor, with sectional liners, or with a drum completely lined with rubber, has been added to the line. All mixer blades are rubber coated.

The Mishco Corporation, 615 S.W. 2nd Avenue, Miami, Fla., are sales distributors for the complete Appley and Appley-Yellen line.

● Waterproofing Sprayer

The Devere concrete sprayer has proven ideal for waterproofing concrete buildings, according to A. Devere Harnett, president of the Devere Company, Racine, Wis. In a recent test case, the Carlson Roofing Company of Racine used the Devere sprayer in waterproofing a concrete building constructed for the Western Printing and Lithographing Company. With the Devere sprayer, the entire 5640 sq. ft. of concrete was waterproofed by two men in less than 2 hours.

The Devere Sprayer is comprised of a tank, a pump and a gasoline engine mounted on an all-steel, two-wheeled chassis. Standard equipment includes

50 feet of hose, a single nozzle boom for spraying inaccessible areas, and an 8 spray-head unit which simultaneously treats a 6-ft. strip of concrete.

L. B. Keen has been appointed a representative for Rhode Island and Connecticut by the Sika Chemical Corporation of Passaic, N. J.

TOUGH
LONG WEARING HEAVY COWHIDE
HAND PADS

Thumb-type Hand Pads, sewed with steel thread for extra wear. Open back, combines the fit of a mitten, with coolness of a hand pad. Uniform weight.

Designed especially for handling blocks, brick, tile and similar materials. These GS Hand Pads offer maximum wear at minimum cost. Workers like them.

No. GS 40
Chrome leather plain
$1.05 pair

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Chrome leather with steel reinforced palm patch
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To avoid the entraining of air, a harsh mix of 2.2 gals. of water per sack of portland cement was used. The problem of distributing the concrete was an acute one, because of the heavy reinforcing and resulting small pour space. Two VIBRO-PLUS Top Dog vibrators solved this problem by rendering the concrete in this mold fluid; and consolidated the dry harsh concrete mixture by PRECISION VIBRATION.

USES: Pipes, gratings, septic tanks, and other specialty forms, also chutes, bins, hoppers.

Write us for specific information as to your particular vibration problem; and free booklet.

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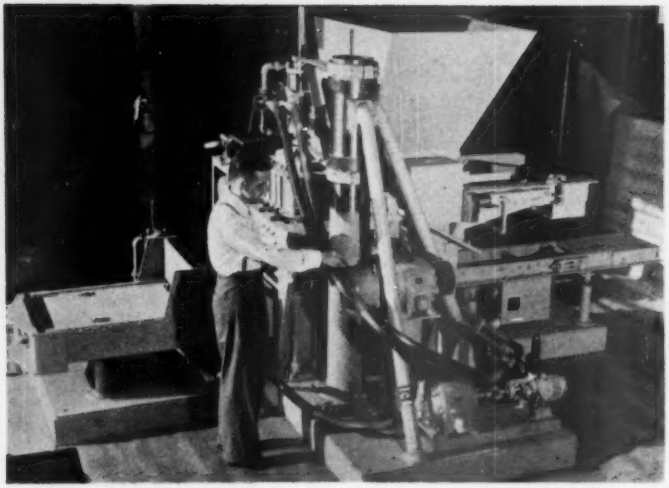

● Block Machine

The Scripps-Pearson Machine Works, Inc., Edmonds, Wash., has put on the market its new 1949 model block machine, available in either fully automatic or semi-automatic type. The machine pictured (semi-automatic) has a capacity of over 4000 units (8- by 8- by 16-in. equivalents) per day. The same model with full automatic operation turns out 4800 units daily. Vibration and compression are combined to produce extremely dense, sharp-cornered blocks.

The semi-automatic machine is driven by five special motors; the fully automatic has six motors. The cycle of the fully automatic machine is fully controllable as to length of operation, range of adjustment and type of aggregate.

Special features cited by the manufacturer include a gear head motor on all reduction drives, rugged pallet feed, feed drawer agitators, and motorized offbearer.

Is your cement storage bin 50 feet or more from the siding? Are there any obstructions between storage and siding regardless of distance to make mechanical handling impractical?

Look into the merits of the Robinson Air-Activated Conveyor. With it, you can get shipments in hopper bottom cars; unload each car in two hours or so; and operate season after season without heavy maintenance. Pipes do not clog because the cement does not encrust. There are no continuously moving parts, screw feeds, bearings, etc., that so frequently cause shutdowns and maintenance.

If you wish to save in costs for handling your bulk cement, investigate the Robinson System. Write to us.

ROBINSON Air-Activated CONVEYOR SYSTEMS

Division of MORSE BOULGER DESTRUCTOR CO.

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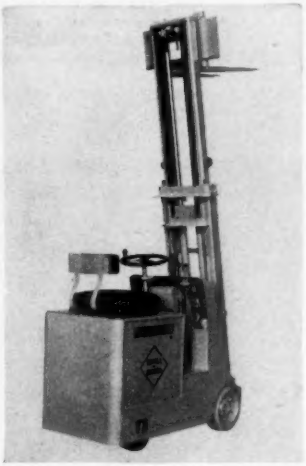
Represented in the French Union and Benelux by Cie Francaise Blaw-Knox, Paris

All cylinders have cast-iron pistons and rings in polished cylinders. Shipping weight of the machine is 11,500 lbs.

● Light-Weight Truck

A relatively small, light-weight, electric-powered industrial truck for fast maneuvering and tiering loads that are not excessively heavy has been developed by Elwell-Parker Electric Co., 4205 St. Clair Ave., Cleveland 14, O. The compact little vehicle can maneuver in narrow aisles and areas. Length overall with 30-in. fork is only 96 in.; width, 32½ in. The straight-line steering mechanism enables it to turn in 60-in. intersecting aisles and in 109-in. right-angle aisles. A low center of gravity contributes to safe handling under all working conditions.



Straight travel speed with full load is 5¼ m.p.h. The maximum height of the lift of fork is 121½ in. Lifting speed, loaded, is at a rate of 28 f.p.m.; lowering load rate is 45 f.p.m. Safety valves control lifting and lowering.

A dual-cylinder, low-pressure hydraulic system operates the lifting mechanism, with cylinders placed at opposite sides in the upright column. The operator sits on a form-fitting, air-foam cushion with a back rest, and he can step on or off the truck from either side.

● Rubber Liner for Mixer

A new abrasion resistant-liner for concrete mixers is the Goodyear "Plioweld" rubber liner, which may be vulcanized in place either on the mixer shell itself or on a separate light-gauge steel liner.

This rubber liner has reportedly proven its worth under severe working conditions. The Keogh Bros. Concrete Products Company, Glendale, Calif., has a two-sack paddle-type mixer in which a Goodyear Plioweld liner was installed. The liner has already been in service longer than the best previous steel liner and shows no sign of wear. This extra service repays the owner for his original investment in actual savings.

M & M ENGINEERING CORP.
Manufacturers of

AUTOMATIC ELECTRO-VISOR QUALITY CONTROL

Announces
ANOTHER FIRST . . .

the New "Electro-Stop" Metallic Brake Stop

for the Stearns type 86B magnetic brake, used on Besser Vibrapacs

PRICE only $30.00 PER SET

This new, extra long life, non-shattering disc will—

1. Reduce shut-down time due to disc breakage.
2. Reduce maintenance costs because of long life (will outlast 2 to 3 sets of the usual molded discs).
3. Reduce brake adjustments because of slower wear.

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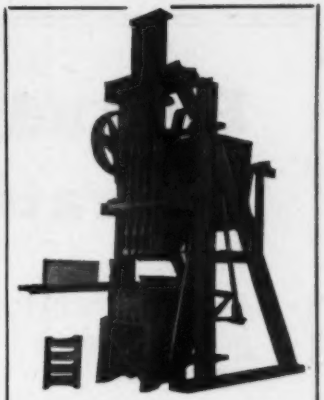
2200 Montcalm St. Indianapolis 23, Ind.

Officials of the Jaeger Machine Company, Columbus, O., manufacturers of construction and paving equipment, have announced the appointment of J. H. Yearling as general sales manager, effective August 8. Mr. Yearling has been associated with Jaeger for 22 years, and served as credit manager and assistant treasurer before entering the Sales Department, here he has been manager of advertising and market research since 1941. As sales manager, much of his time will be spent in the field, coordinating the work of the Jaeger sales organization with distributors in 130 cities of the United States and Canada.

J. H. Yearling

The Jaeger Machine Company builds an extensive line of contractors' and industrial pumps and air compressors, concrete, plaster and mortar mixers, bituminous and concrete paving spreaders and finishers, truck mixers and hoists. Sales are exclusively through distributors, with whom the work of the company's own field representatives is closely integrated. Export sales in substantial volume are also made through resident distributors in all principal countries of the world.



An All-Purpose Machine

The Junior Stripper will turn out more blocks per man than any other hand-operated machine on the market . . . 900 per hour being easily maintained! Nor has quality of output been sacrificed for the sake of speed. Units are uniformly dense, true to shape, of uniform texture.

Stearns Clipper Stripper Machines; Stearns Joltcrete Machines; Stearns Mixers; Cast iron and press steel pallets. Straublox oscillating attachments, etc. Repair parts for: Anchor, Stearns, Blystone Mixers and many others.

ANCHOR CONCRETE MACHINERY CO.
G. M. Frisl, Manager **Columbus, Ohio**

Dunbrik Mfg. Plant Leased To Dallas Roofing Tile Firm

Manufacture of Dunbrik, a low-cost colored concrete face brick made largely of local materials, began recently at Dallas, Tex., under the management of J. C. Bond. Mr. Bond has leased the Dallas Dunbrik Manufacturing Company's plant from A. W. Skelton, builder and owner of the facilities. Capacity of the plant is 15,000 Dunbrik units per day or 5,000 Dunstone units. The latter are natural-colored triple-size units for backup walls.

The plant is being operated by Joe H. Bond, who has been associated with his father in manufacturing colored concrete roofing tile. The Bond company machinery has been moved to the new location, where, in addition to Dunbrik and Dunstone, the firm is also manufacturing concrete septic tanks and concrete drain tile.

Florida Modern Crete, Inc. To Open Plant in Clearwater

Florida Modern Crete, Inc., 878 31st Street, South, Saint Petersburg, Fla., which manufactures the masonry product known as "Modern Crete," plans to establish a plant in Clearwater, according to announcement made recently. The firm holds the exclusive manufacturing rights for 11½ west central Florida counties.

According to Frederick R. Barkley, sales manager for the firm, the company expects to spot six or more plants in the Clearwater area.

AT LAST... A Truly Dependable Concrete Roof Tile Machine!

The new Perma-Tile semi-automatic vibrator machine, representing 10 years of development and engineering, possesses these exclusive advantages:

- Smooth finish troweled in by the Perma-Tile machine automatically . . . no skilled operator is required.
- Every tile a perfect tile . . . strong, lightweight, durable.
- Makes either the popular streamlined, or the half-round Mission style roofing tile.
- Easy for anyone to make 240 perfect interlocking tile hourly . . . simple to apply with the lifetime PermaClip . . . distinctive beauty sells on sight.
- Perma-Tile Machines cost little more than so-called "machines" that require a highly skilled operator to produce an acceptable product.

New PERMA-TILE Vibrator-powered Roofing-Tile Machine . . . semi-automatic action permits anyone to make a perfect tile per minute . . . no training or skill required.

Perma-Tile Machines are ruggedly built, foolproof, dependable. Pound-for-pound, concrete in the form of Perma-Tile is the most profitable concrete product you can produce. Write or wire for all the facts . . . TODAY!

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Gentlemen:

We have been using Ayr Trap on many thousand yards of concrete for approximately one year.

Our experience with Ayr Trap has been entirely satisfactory.

We have found:

1. Concrete with this mix does not suffer any reduction in strength in the richer mixes and in the leaner mixes show an increase in strength.

2. Same is not sensitive to variations in the type and amount of sand incorporated in the mixes, therefore, we are not called upon to change the amount we add everytime a new sand or a different mix is used.

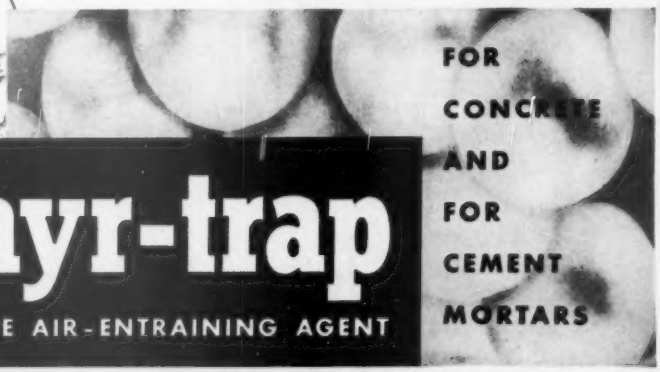
3. No elaborate equipment is necessary for dispensing same. Ordinary pint measure is used. Variations on the recommended quantities does not seriously affect the results.

4. Adding this material to the mixes simplifies our plant operations in that we do not have to tie up any storage hoppers as would be required with the interground cement. Errors that would result with the variations of cement as required are reduced.

Very truly yours,

COLONIAL SAND & STONE CO., INC.

Frank L. Kelly
Vice President



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Write today for important data on Ayr-Trap as used by these big firms to save money

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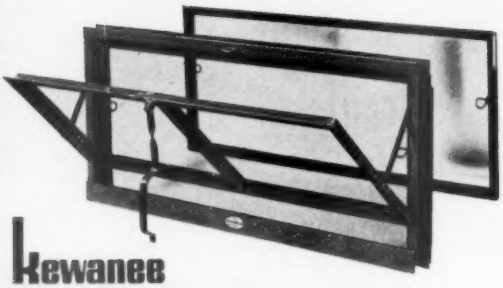
10th Street & 44th Avenue, Long Island City 1, N.Y. • HOUSTON • CHICAGO • SAN FRANCISCO • TORONTO

Home Builders Want Quality In 1949

And They Will Get It In KEWANEE WINDOWS

Good builders everywhere recognize the importance of giving the 1949 home buyer maximum value for his money. This includes furnishing rugged, tight-fitting windows that are easily operated and easily screened. Kewanee dealers will benefit from this increased demand for quality.

Basement!



Kewanee MASTER BASEMENT WINDOW

Here is the finest basement window made today. Why? —

Mr. Builder says: Its heavy channel frame will stand rough handling on the job. The wide centered fins give secure anchorage in any type of construction. The design of the jambs and the broad sill eliminate mortar fouling, and speed up installation.

Mr. Home Owner says: The double-weathering contact cuts down my fuel bills. The long-handled cam latch is easy to operate from floor level. The vent "stays put" in any position. Screens and storm sash snap on, without clips, screws or tools.

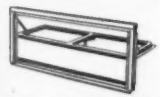
Utility!

Also available with Guard Bars.

Kewanee UTILITY WINDOW

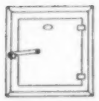
Kewanee's Utility Window is approved by builders as *the* weathertight window for garages, filling stations and other small buildings. Positive acting cam latch to lock TIGHT; hot rolled sections designed for heavy use; vent opening inward to give deflected ventilation. Uses same screen as Kewanee Basement Window.

OTHER KEWANEE PRODUCTS

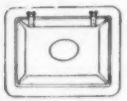


STEEL & ALUMINUM BASEMENT WINDOWS

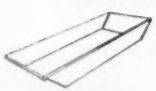
UTILITY & COMMERCIAL WINDOWS



CLEAN-OUT DOORS



COAL CHUTES



STEEL MORTAR BOXES

TRUCK BODIES AND HOISTS

FIREPLACE DAMPERS • WINDOW WELLS

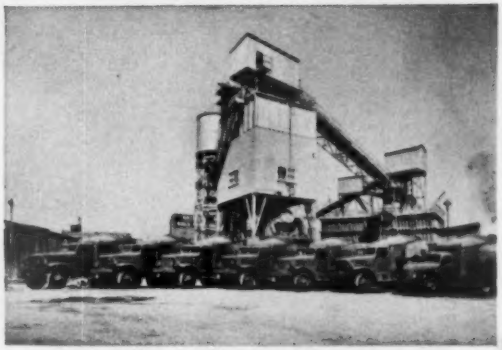
PORTABLE CONCRETE POURING CHUTES

KEWANEE MANUFACTURING COMPANY

147 BURLINGTON AVE.

KEWANEE, ILLINOIS

Jaeger dual-mixed specification concrete



is highest quality, accepted on all jobs,

yet often costs less in place in the forms

Because it is positively dual-mixed, accurately controlled for slump and delivered without segregation over any kind of haul, concrete mixed to specification in Jaeger Truck Mixers is known and accepted by architects and engineers *on every type of work.*

The contractor also enjoys a cost-saving advantage. Concrete delivered by Jaeger Truck Mixers is definitely more workable, is poured faster under perfect control and on the dependable schedules maintained by Jaeger-equipped plants which are the pace-setters of the industry.

More concrete is sold today in Jaeger Truck Mixers than by any other method. The Jaeger Machine Company, Columbus 16, Ohio.

Only Jaeger supplies top or end loading mixers to meet plant and local aggregate requirements, in all standard Truck Mixer Bureau ratings — 2 - 3 to 5½ - 7⅝ cu. yds. Ask for Catalog TM-8.

JAEGER

engineered equipment

"NEW STANDARD" SIZE AIR COMPRESSORS UP TO 600 CFM
PUMPS UP TO 240,000 GPH • 2-SPEED HYDRO-HOISTS UP TO 100 HP

Accurate batching on a barge

Typical of the durability and accuracy of Yale Load King Batching Scales is this installation on a floating concrete batching plant. Fair weather or foul, concrete is batched to the exacting specifications required in lock and dam construction.

The eight Yale Dial Heads are equipped with photo-electric cells and recorders. All are operated by push-button, the weighmaster controlling the quantity of each mix from the panelboard. Automatic operation with remote control like this not only assures top accuracy in batching but cuts costs by saving time, effort and materials.

Yale Load King Batching Scales are built to withstand the constant, heavy-duty service required in batching concrete on land and water. Dependable, sustained accuracy and freedom from costly maintenance are made possible by the unique design and construction of the exclusive Yale MAGNETROL mechanism and dust, water and moisture-proof dial head.

Engineered specifically for the job, Yale Load King Batching Scales save money wherever they are used. For expert counsel in applying Yale Load King Scales to your concrete manufacturing operation, get in touch with our nearby representative or write direct to Yale.

THE YALE & TOWNE MANUFACTURING COMPANY

ROOSEVELT BOULEVARD • DEPARTMENT R-23 • PHILADELPHIA 15, PA.

YALE

TOOLS THAT KEEP INDUSTRY "ON THE MOVE"

INDUSTRIAL DIAL SCALES • HOISTS—HAND AND ELECTRIC • TRUCKS—HAND LIFT AND POWER

IT'S BIG • IT'S FACTUAL! • IT'S COMPLETE!
IT'S READY NOW

1949 Edition
CONCRETE INDUSTRIES YEARBOOK

Largest in its History... incorporating all the latest available information on machinery equipment and processes

Completely Re-written—Pages of New Information

Because of the rapid growth of the industry in the past few years, and the important technological developments which have accompanied that growth, the Yearbook has been re-edited from front cover to back. Pages of new information, drawn from the experiences of the industry's outstanding producers, have been added to make this edition more than ever the indispensable text book of the concrete field.

Helps Solve Tough Production Problems

Established producers and newcomers alike will find in this bigger and better Yearbook a wealth of well-arranged, specific operating information to assist them in solving production problems and increasing profits. Plant design, the selection and characteristics of raw materials, batching, mixing, curing, handling and marketing are just a few of the important subjects treated.

Experienced Operators Turn to the Yearbook as the Final Authority

When new plants are built, when equipment requires replacement, or when existing plants require modernizing and expansion, experienced operators unfailingly turn to The Concrete Industries Yearbook for the know-how information they must have. Today, just as when it was first published 11 years ago, the Yearbook is absolutely unique in its field. And in every year since its inception the demand for copies has far exceeded supply.

Supply Limited — You Cannot Be Sure of a Copy Unless You Order Now

With every producible block, joist and cubic yard of concrete desperately needed today to ease the most severe housing shortage this nation has ever known, you will want more than ever to have on your desk this practical, down-to-earth guide to better production and higher profits.

So place your advance order now and avoid the risk of being disappointed. The supply will be limited, and distribution will be on the first come, first served basis.

$1.00 A COPY

Supply limited - Order your copies NOW . . .

MAIL THIS HANDY ORDER FORM TODAY

Concrete Industries Yearbook,
538 S. Clark St.,
Chicago 5, Illinois

For the attached check, send me ..... copies of the 1949 edition of the Concrete Industries Yearbook.

Name .....

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City .....Zone.....State.....

YOUR PLANT CAN GAIN EFFICIENCY
YOUR QUALITY IMPROVED
YOUR PROFITS INCREASED
WITH
OSWALT ENGINEERING SERVICE

Dual Vibrator
Synchronized Vibrator
Compound Vibrator

Applicable to
Vibrapac Plants
Only

Write or Call

OSWALT ENGINEERING SERVICE CORP.

1335 CIRCLE AVE. **FOREST PARK, ILL.**

PHONE: COLUMBUS 1-7073 — FOREST 3898

GO ROCKERCRETE
for
QUALITY UNITS WITH DEPENDABLE PRODUCTION

Vibration Under Pressure
Fewer Wearing Parts
No Crystallization

— OUR GUARANTEE —

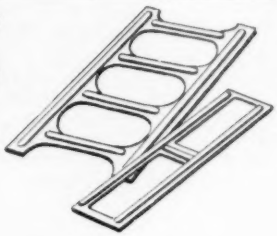
Modern improvements with engineering, workmanship, and Link-Belt standard parts make it possible for us to guarantee that maintenance parts for the first full year's operation will not exceed $100.00.

No Other Manufacturer Can Make This Statement

Write — Phone — Wire
for
Our Lowest Prices in History

ROY DARDEN INDUSTRIES, INC.
P. O. Box 95 Northside Branch Atlanta, Ga.
Exclusive Distributors for
F & A Floor and Roof System Equipment

70%
of the Vibrators utilize



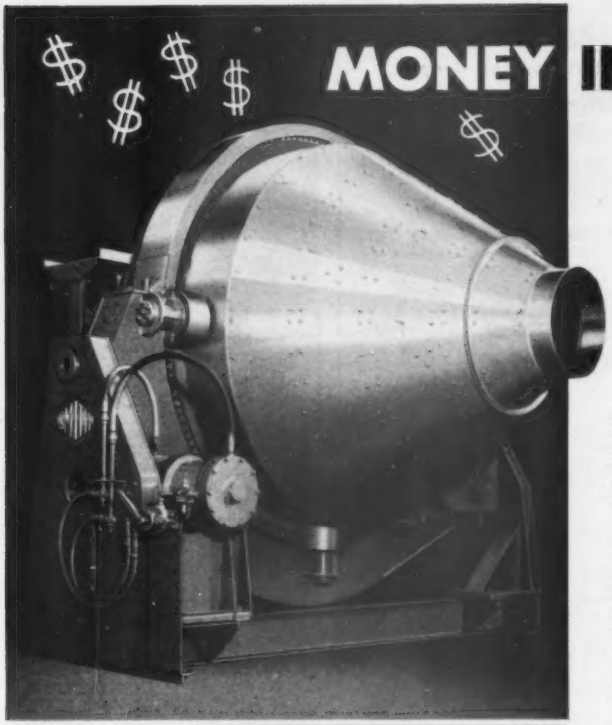
COMMERCIAL Cored Steel PALLETS

That big majority that votes for Commercial Pallets is "sold" on their proved ability to function for years without apparent wear, turning out perfect concrete blocks.

Commercial Pallets do not break, warp or crack. They can be handled "any old way" without being damaged, and they don't need filing, grinding, planing or sawing to fit the core box.

Write for our Booklet

THE COMMERCIAL SHEARING AND STAMPING CO.
YOUNGSTOWN, OHIO



MONEY IN THE BANK!

It isn't what you spend, it's what you **SAVE** that means money in the bank. Smith Tilters and Smith-Mobile Agitators are a winning combination that really save you money.

The cost of a Smith Tilter is saved over and over again in bigger payloads for your agitators and time saved in getting agitators out of the yard. Smith Tilters shrink a batch in a hurry and mix it smoothly, without the usual violent action of other concrete mixers. In discharging the batch, there isn't the slightest segregation.

Smith-Mobile Agitators are built to do a rugged job. They carry their rated load, day-in and day-out, and will discharge dry or low slump concrete faster than any other agitator. Smith-Mobiles are handling critical concrete to the satisfaction of engineers, contractors and operators, *no matter how rigid the specifications.*

Write today for new Smith Tilter and Smith-Mobile bulletins just off the press.

SMITH TILTERS

1, 2, 3, 4, 5 and 6 YARD SIZES

SMITH

BIGGER Payloads!
LOWER Costs!
MORE Profits!

THE T. L. SMITH COMPANY
2887 No. 32nd Street, Milwaukee 10, Wis., U.S.A.

SMITH-MOBILE AGITATORS

3, 4¼, 6⅛ and 7⅜ YARD SIZES

A-5650-IP

FOR SALE

1—complete Tile Factory.

1—#3—Flam vibrator machine and motor.
2—Stripping presses
440' of off baring conveyor
217 Pallet holders—iron
535 Stock pile decks—wood
1500—Wood pallets with metal clips—Approx.
1—4x8x12" mold
1—4x6x12" mold
1—4x6x12" mold Bull nose
1—4x8x12" mold Bull nose
1—4x8x12" mold Round corner
1—4x6x12" mold Round corner
1—4x8x14" mold Round corner
1—4x8x14" Standard mold
1—Brick mold Standard
All equipment above is 90% new. Total Price F.O.B. our Plant, Chowchilla, California: $1875.00, plus state sales tax.

SAN JOAQUIN VALLEY PIPE & CONST CO.
Chowchilla, California

FOR SALE

Used No. 9 Joltcrete
With 4", 6", 8" & 12" Mold Boxes
Adequate Pressed Steel
Pallets for All Mold Boxes
Used Stearns Model 15
Both Machines in Good Condition

CONCRETE BLOCK PLANT EQUIPMENT COMPANY
Empire Bldg., Birmingham, Alabama

Offering for Client at Sacrifice
LATE 1948 CINDER BLOCK PLANT (Dismantled)

Used Approx. 1 Week
Complete with All Accessories
Capacity 2400—8"x8"x18" Blocks Per Day
Full Details Upon Request

Construction & Power Machinery, Inc.
270—23d St., Brooklyn 15, New York
Tel. South 8-4900

New Blade Mixer For Sale

1—12 cu. ft. Darden Link Belt Mixer with clutch, drives and 10 H.P. enclosed motor (no starter) $1125.00 F.O.B. Plant

LOUISIANA CONCRETE PRODUCTS, INC.
Box 1107, Baton Rouge, La.

PACKER-HEAD WINGS
McCracken Type — PROVED to last as long or longer — yet cost considerably less. Write for prices.

TEXAS FOUNDRIES
LUFKIN, TEXAS

SPACE HEATERS

War Surplus Bargain

New — Ready To Use!

40,000 BTU capacity

—Burning gasoline, kerosene or diesel fuel.
—Electric blower—12 V. DC or 110 V. AC using small transformer.

Portable, Quick, Clean Heat

Ideal for curing room, concrete plants, work under construction, emergency heat, or auxiliary heaters.

$95.00 each

Clapp, Riley and Hall Co.
14 No. Clinton St.,
Chicago 7, Illinois

FOR SALE — TO SETTLE ESTATE

Well stocked Builder's Supply Business
Modern Concrete Block Plant
Concrete Burial Vault Plant

Located in one of the fastest growing cities in Ohio. Only Concrete Block Factory, and only Concrete Burial Vault Factory in City. Just one other Building Supply Dealer. All brand new Concrete Block Equipment—yearly output over 300,000. This business operates the Pioneer Vault Works in the State of Ohio, the founder having purchased the first Burial Vault Molds sold in the State of Ohio, and now placing around 700 vaults per year. May be purchased for Inventory Price Alone.

Write or Inquire:

West Builder's Supply
612 W. Gambier Street
Mt. Vernon, Ohio

FOR SALE
BESSER EQUIPMENT

One—2½ cu. ft. Besser Mixer with motor, plus one unused Gate Plate, one Gate Liner and two Dust Hubs, in splendid condition $900.00
One Besser 2½ cu. ft. Skip-Loader, in splendid condition 650.00
Two, Multiple-stroke Hydromatic Lift trucks, in splendid condition, each.. 200.00
75—30 block Steel Racks, each..... 15.00
500 Steel Pallets, 12¼" x 18½" x ¼", all perfectly flat, each..... .50
All prices FOB our plant, subject to prior sale.

BOWLING GREEN CONCRETE PRODUCTS CO.
BOWLING GREEN, KENTUCKY
Phone 2296

FOR SALE

1—No. 7 Stearns Joltcrete, less than 2 yrs. old
1—28 ft. Stearns Mixer
1—28 ft. Stearns Skip Loader
1—Power offbearer
1—Weigh Batcher
1—8" attachment
3000 8" pallets
60 racks
1—Stearns 12 cu. ft. Mixer

Box No. L 9
c/o Pit and Quarry Publications
538 So. Clark St. Chicago 5, Ill.

CEMENT COLORS — PROMPT SHIPMENTS

Write for samples and prices of "LANSCO" CEMENT COLORS in bright shades of RED, YELLOW, GREEN, BLUE, BLACK, BROWN. Manufactured by

LANDERS-SEGAL COLOR CO.
76 Delevan Street, Brooklyn 31, N. Y.

If you want to

CLEAN YOUR PALLETS,

Write to* BERGEN MACHINE & TOOL Co., Inc., 189 FRANKLIN AVE., NUTLEY 10, N. J. *for Free Literature describing the* AUTOMATIC MACHINE *which cleans an* 18½x26" *plain pallet in* 12 *seconds.

UNBREAKABLE PALLET RINGS
Write for full information
TEXAS FOUNDRIES
LUFKIN, TEXAS

MINERAL COLORS
for
BRICK MORTAR STUCCO-PLASTER-CONCRETE

"Fine Because of Their Fineness"
Ask for samples and recommendations.
BLUE RIDGE TALC CO., INC.
HENRY, VIRGINIA

FOR SALE
COMPLETE CINDER BLOCK PLANT

1—8" George Machine convertible to 4" (Vibrator)
1—12" Machine convertible to Chimney maker
1—Mixer
2—Belt conveyors 1—Hand lift-truck
31—Block racks Over 4000 pallets
Price $4500.
(Owner passed away)
MRS. R. SUGDEN
22 Rutgers Terrace, Fairlawn, N. J.
Fairlawn 6-4058J

FOR SALE

Soffett Tile Attachment (used twice) 8"x8"x24" for Besser Vibrapac $650.00 FOB Plant.

LOUISIANA CONCRETE PRODUCTS, INC.
Box 1107, Baton Rouge 2, Louisiana

FOR SALE

"Quinn" Heavy Duty Pipe Forms for concrete culvert pipe complete.
4—12" 6—15" 2—18"

Fay Bros. Const. Co., Carthage, Ill.
Telephone—Frank Fay, Basco, Illinois

FOR SALE

Brikcrete Machine & equipment—like new. Makes units 12" x 8" x 4" and 12" x 4" x 4".

EUCLID MARTIN
Route 2 Bourbonnais, Ill.

FOR SALE
COMPLETE BLOCK PLANT EQUIPMENT

MULTIPLEX 8-BAR TAMPER 85 H.P. GEARHEAD MOTOR $275; 12 CU. FT. MIXER & 5 H.P. MOTOR $200; 20 FOOT CONVEYOR & 1 H.P. MOTOR $125; 25 STEEL RACKS $4.00 EACH; 1400 CAST IRON 7⅝"x15⅝" 45% A.S. PALLETS A-1 CONDITION 35c EACH IF YOU TAKE 1400.
Will sell separate or all for $900.00 F.O.B.
RICHMOND CEMENT PRODUCTS, Richmond, Ill.

FOR SALE

Multiplex Chimney Block Machine 60 pallets for making 16 x 16 Chimney blocks with nine inch round flues. Complete, $225.00.

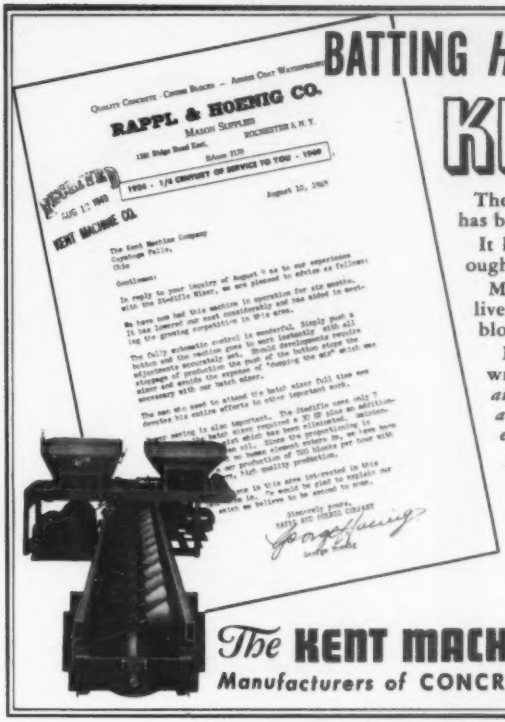
Goshen Verilite Co.
512 N. 7th Street, Goshen, Indiana

FOR SALE

1—Jackson and Church six pocket concrete brick press, capacity 12,000 brick in 8 hours, in good condition, used less than six months. Price $6,500.00.

CHESTER M. BRASSE, Trustee
2030 16th Street North
Arlington, Virginia

BATTING *HIGH* IN THE *BIG LEAGUE*


Quality Concrete · Crane Buncs · Assure Cost Watchers

RAPPL & HOENIG CO.

Mason Supplies

ROCHESTER 8, N. Y.

1930 - 1/4 CENTURY OF SERVICE TO YOU - 1949

August 10, 1949

KENT MACHINE CO.

The Kent Machine Company
Cuyahoga Falls,
Ohio

Gentlemen:

In reply to your inquiry of August 5 as to our experience with the Stediflo Mixer, we are pleased to advise as follows:

We have now had this machine in operation for six months. It has lowered our cost considerably and has added to work-ing the growing competition in this area.

The fully automatic control is wonderful. Simply push a button and the machine goes to work instantly with all adjustments accurately set. Should development require alterations in production the push of the button stops the mixer and avoids the expense of "dumping the skip" which was necessary with our batch mixer.

The man who used to attend the batch mixer full time now devotes his entire efforts to other important work.

Another saving is also important. The Stediflo uses only 7 sacks of cement per batch mixer required a 20 CU yard batch mixer which has been eliminated. Moisture-content is also closely controlled. Since the proportions of cement to aggregate remain almost the same element enters in, we have been able to increase production of 720 blocks per hour with our present labor force, but quality production.

Anyone in this area interested in this machine is welcome to call. We would be glad to explain our experience with it. We believe it to be second to none.

Sincerely yours,
RAPPL & HOENIG COMPANY
George Hoenig
Owner

KENT STEDIFLO MIXER

The KENT Stediflo Mixer referred to in the letter at left has been "hitting the ball" consistently.

It has maintained a "high average" in output of thoroughly and economically mixed concrete.

Moreover it is in the "big league"— consistently delivering concrete in volume to amply serve *one of the largest* block machines.

Mr. Hoenig of the progressive firm of Rappl & Hoenig writes enthusiastically—*it has lowered costs considerably—aided in meeting competition—is fully automatic—releases a man for other work—saves power—eliminated the human element—aids in maintaining a production of 720 blocks per hour—has been nil in maintenance cost.*

If you operate a large plant you need only install a Stediflo and let its cost saving advantages pay for itself. If you operate a smaller machine comparable advantages are available to you in the KENT Flo-master mixer which operates in the same advanced principle.

WRITE TODAY FOR COMPLETE INFORMATION

The KENT MACHINE CO. Cuyahoga Falls, Ohio

Manufacturers of **CONCRETE PRODUCTS MACHINERY** *Since 1925*

CONCRETE MANUFACTURER USED EQUIPMENT SECTION

FOR SALE

Besser Vibrapac—makes 3-4, 2-6, 2-8, 1-10, 1-12, 8" header, air offbearer, Besser 25' mixer, 30' skip, in good cond. with many new parts, approx. 1700 steel pallets, 70 steel racks, air compressor, water meter, automatic transporter with new battery & parts, new—never used 45' steel enc. belt bucket elev., 45 yd. 2 comp. steel bin with vol. batcher, 1948 Erickson fork lift used very little, with motors, starters, switches, all for $20,000.00.

Besser semi-automatic 3½ per minute tamper with V belt drive and pallets $600.00.

25' Multiplex mixer, motor & V belt drive, new liners, like new $1200.00.
35' open steel bucket elev. with new Pintle chain $300.00.

Int. K-8 with 10 motor 24' flat bed Highway Trailer with 10.00 tires all around, low mileage, first class shape $4000.00.

STRONG BLOCK CO.
La Crosse, Wisc.

UNUSED BARGAINS

TWO * YALE & TOWNE LOW LIFT PLATFORM TRUCKS

Powered by Ready-Power Gas Elec. 4,000# capacity—will handle 90 Block Racks. A $4,000 value for only $1,250 each Norfolk.

GUILLE MACHINERY COMPANY
Ph. 49453 **Box 6067, Norfolk, Va.**

WANTED

BLOCK MACHINE SALESMAN to organize sales and distribution, advertising and servicing of patent new small brick and block and tile making machine amongst farmers, small builders and brick and block makers throughout nation. State age, experience and remuneration required.

Box No. L-3, c/o Pit & Quarry Publications
538 So. Clark Street **Chicago 5, Illinois**

FOR SALE

Modern Ready-mix and Concrete Block Plant combined. Good going business and good future business outlook. 1000 block and 50 yard daily capacity. Includes ¾ yd. crane, trailer truck, 2 concrete trucks, block and ready-mix machinery, building, etc. On railroad siding.

TALMAGE CONCRETE PRODUCTS
Talmage, Nebraska

FOR SALE

Stearns No. 9 Jolterete. A-1 condition with 15,000 pallets (pressed steel), 100 (72 block) racks. 4"-8"-12" units and 8" header attachment. 42' mixer—vertical skip. Can be seen in operation at Baraboo.

BARABOO CONCRETE PRODUCTS CO.
Box No. 361 **Baraboo, Wisconsin**

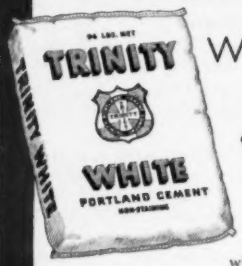
WANTED TO BUY

Besser "Victory" Vibrapac Block Machine, with pallets. Must be in good condition and reasonable.

Box No. L 8, c/o Pit and Quarry
538 So. Clark St. **Chicago 5, Illinois**

sell your trade the whitest

white cement



A whiter white cement that gives greater beauty wherever used...widely and consistently advertised to your customers.

Trinity Portland Cement Division,
General Portland Cement Company
111 W. Monroe St., Chicago; Republic Bank Bldg., Dallas; 816 West Fifth St., Los Angeles

as white as snow

...for white or colored stucco...

cast stone... terrazzo... cement paint

...concrete architectural units...

and for many light reflective uses

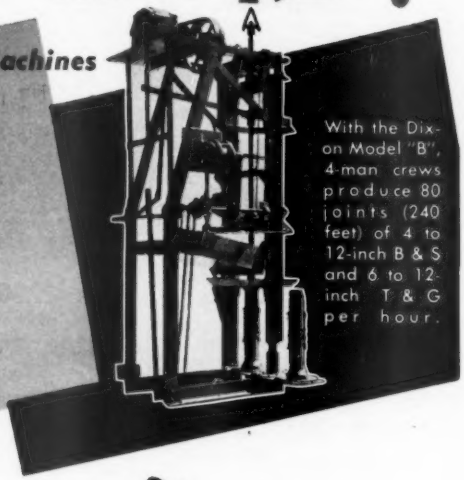
Increase your MARKET!

with Dixon Pipe-Making Machines

The NEW Dixon Model C Hydraulic Pipe Machine produces 3 and 4-foot joints that exceed ASTM specifications at higher speed, with smaller crews and less operating expense.

Now you can turn out 4 to 15-inch bell and spigot or 6 to 16-inch tongue and groove pipe at highly competitive prices and still maintain reasonable margins of profit.

Full production crews produce 1,200 to 3,000 feet, 16½ to 57 tons of pipe per 8-hour day.



With the Dixon Model "B", 4-man crews produce 80 joints (240 feet) of 4 to 12-inch B & S and 6 to 12-inch T & G per hour.

Dixon Packerhead Pipe Machines, Pipe Bend Machines, Spiral Blade Mixers, Belt Conveyors, Septic Tank Molds, and Off-Bearing Carts. For full information write to:

Dixon
PIPE MACHINES

HOUSTON CONCRETE MACHINERY CO. 6600 WASHINGTON AVE., HOUSTON 7, TEXAS

"WHO'S IN CHARGE HERE?"

You are—you, the customer. You're the one who brought about the formation of the Truck Mixer Manufacturers Bureau.

You didn't like the multiplicity of sizes and capacities of truck mixers. You didn't like the constant changes in capacity that meant that your machines became obsolete in a hurry. You didn't like not being able to bid accurately and figure your truck mixer costs accurately. Your collective, justified complaint demanded that something be done.

And it was. We organized the Truck Mixer Manufacturers Bureau to set up standards that guaranteed size and capacity. We put a rating plate on the side of each truck mixer so that you could see how large it was, buy on mechanical merit, and figure your operating costs easily.

So look for that rating plate. It's your guarantee of size and accuracy . . . your guarantee that you're in charge here.

2 CUBIC YARD MIXER
GUARANTEED TO HOLD, MIX AND AGITATE ITS RATED CAPACITIES AND CERTIFIED TO COMPLY WITH TRUCK MIXER MANUFACTURERS BUREAU STANDARDS AS APPROVED BY N.R.M.C.A.
3 CUBIC YARD AGITATOR
N.R.M.C.A. REGISTRY NO.

Truck Mixer Manufacturers Bureau

Affiliated with The National Ready Mixed Concrete Association

BLAW-KNOX DIVISION
Pittsburgh, Pa.

CHAIN BELT COMPANY
Milwaukee, Wis.

CONCRETE TRANSPORT MIXER CO.
St. Louis, Mo.

THE JAEGER MACHINE COMPANY
Columbus, Ohio

WORTHINGTON PUMP & MACHINERY CORP.
RANSOME DIVISION, Dunellen, N. J.

THE T. L. SMITH COMPANY
Milwaukee, Wis.

LIGHT WEIGHT • SOUND PROOF • INSULATING

uniform graded

pumice

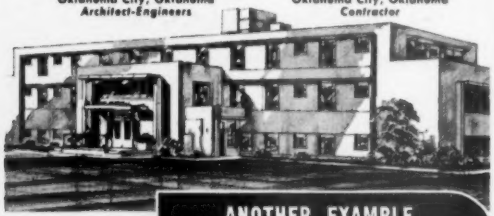
aggregate

FIRE PROOF • NAILABLE • SAWABLE

Jackson County Memorial Hospital

Hudgins, Thompson, Ball and Associates
Oklahoma City, Oklahoma
Architect-Engineers

Lippert Bros. Construction Co.
Oklahoma City, Oklahoma
Contractor



ANOTHER EXAMPLE
of Pumice Concrete Construction

Compressive Strength 2500 psi
Weight 75 lbs. Per Cubic Foot

Lightweight concrete, properly designed with uniform graded pumice aggregate, offers many structural advantages and actual construction savings that are worth careful consideration by architects and engineers. At Altus, Oklahoma, for example, the dead load of the structural frame for this monolithic hospital building was reduced approximately 50% by the use of pumice concrete. A saving of 45% in reinforcing steel with the same live load capacity was accomplished. In addition to these advantages, usable space efficiency was improved materially due to a smaller supporting frame made possible by the lighter load.

Plus Value! **THERMAL INSULATION**

Taking full advantage of the insulating value in pumice, the designers of the Altus hospital used 8" roof and floor slabs with an insulating value approximately equal to a normal 6" slab of ordinary heavy concrete PLUS 3" of insulating material.

Plus Value! **ACOUSTIC INSULATION**

Where acoustic properties are desirable, the walls of this material are finished with a rough texture, the resulting high percentage of sound absorption achieves a quietness that adds materially to the comfort of occupancy. This characteristic is especially noticeable in masonry walls and partitions.

Plus Value! **LOW SOUND TRANSMISSION**

Average transmission losses of 53 decibels have been ascertained for this material. This low transmission factor greatly reduces the chance of noise in one room disturbing the quiet in other rooms.

GENERAL PUMICE CORPORATION
P.O. Box 1443
Santa Fe, New Mexico

PUMICE, LLOYD A. WILLIAMSON
Bend, Oregon

MEMBERS

DESERT MATERIALS CORPORATION
6371 Wilshire Blvd.
Los Angeles 36, Calif.

PUMICE AGGREGATE SALES CORPORATION
121 South Yale
Albuquerque, N. M.

PUMICE PRODUCERS ASSOCIATION

715 FIRST NATIONAL BANK BLDG. • ALBUQUERQUE, NEW MEXICO

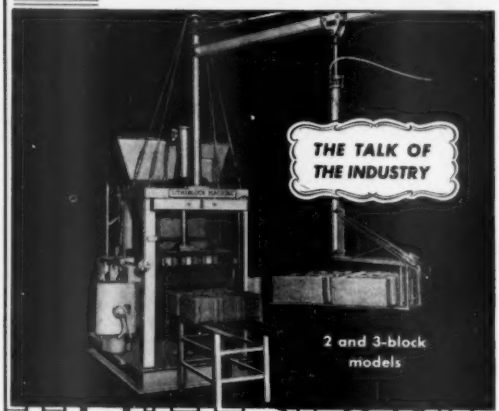
UNIFORM GRADED PUMICE is a name applied only to pumice aggregate produced by members of the Pumice Producers Association. Write your nearest producer for technical data. Additional information is in your 1949 Sweet's Architectural (4E/3) and Engineering (4A/8) files.

THE EMBLEM of the Pumice Producers Association stands for Quality Pumice suitable for aggregate in the production of lightweight concrete for structural purposes. It is for your protection; only members of the Association and their franchised manufacturers are permitted to display it.

IF YOUR GOAL IS

- **LOWER PRODUCTION COST**
- **MORE BLOCKS PER DAY**
- **BETTER QUALITY PRODUCT**

Then here's your machine



LITH-I-BLOCK

Write **LITH-I-BAR CO.**
Dept. 110, Holland, Mich.

Hi-Lo-

CONCRETE TRANSPORT MIXER CO.

TRUCK MIXER

Hi- DISCHARGE · PRODUCTION · SPEED · PROFITS!

Lo- WEIGHT · COST · MAINTENANCE · TIME LOSS

REVOLUTIONARY TRUCK MIXER DESIGN

CONCRETE TRANSPORT MIXER CO.

4989 FYLER AVE. . . . . ST. LOUIS 9, MO.

QUALITY

MILLERS PREPARED ANTHRACITE

CINDERS

SHIPPED ANYWHERE IN CARLOAD LOTS

- Eliminate Mixing Troubles
- Speed Production
- Produce Top Quality Blocks
- Reduce Production Costs

These cinders are processed from carefully selected deposits that are free from stain-producing and combustible materials.

Write NOW For Details

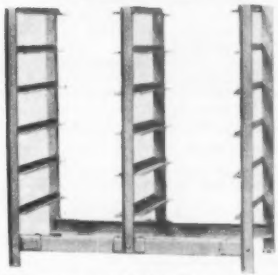
H. HESSEY MILLER P. O. Box 495 Chester, Pa.

---

no extra cost!

Chase Block Racks

built of corrosion-resistant high strength alloy steel



Note our improved rigid side sill connection.

- Shipped knocked down for low freight cost.
- Easy to assemble—no special tools or welding required.

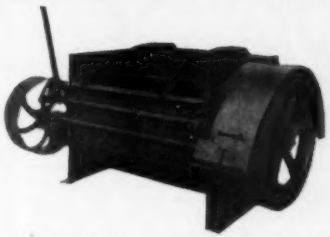
Rack shown is 72-block capacity to handle 24 18½" x 26" pallets for use with fork or platform lift truck. Has ample clearance for magnetic offbearer. This is the most popular type of block rack used. However, we can incorporate this corrosion-resistant steel, rigid field connection and sturdy construction on any style or capacity rack or car you may require.

CHASE RACKS — CARS & TRUCKS

The Chase Foundry & Mfg. Co.

Columbus 7, Ohio

THE PRASCHAK MIXER



16 Cu. Ft.
$600.00
Also
8 Cu. Ft.
$450.00
21 Cu. Ft.
$675.00

"The Mixer That Can Take It"

Other Concrete Products Equipment:

Block Machines — Silo Stave Machines
Cinder Screens — Cinder Crushers
Conveyors — Lift Trucks
Cup Elevators

Prompt Shipment!

WRITE FOR LITERATURE AND PRICES

PRASCHAK MACHINE CO.
MARSHFIELD WISCONSIN

WRITE OR PHONE

for full information on

GOCORP BLOCK MACHINES

Gocorp Clipper • Batch Mixer Gocorp-Yoder Continuous Mixer and Block Tester • Gocorp Tile Machine • Skip Loader • Hoist Joltcrete Automatic Pallet Feeder • Gocorp Attachments and Parts for Stearns Equipment

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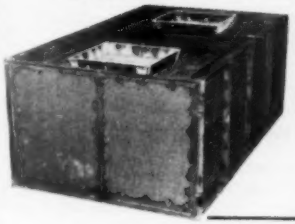
CARPENTER SEPTIC TANK FORMS

and handling equipment are preferred by large precast tank manufacturers because they are:

QUICKLY *poured stripped handled reset for pouring again*



And lastly, loaded transported and set in the hole by *ONE MAN*.

CARPENTER MANUFACTURING COMPANY

Phone 22018
R.F.D. 1, Box 470
Richmond 23, Virginia

MAKE PROFITABLE IMPROVEMENTS
Better—with CONCRETE
This charming, fireside CONCRETE HOME may easily become
HOW TO GET A CONCRETE HOUSE
. . . and what will it cost?
Phone a local concrete masonry manufacturer for names of architects and builders experienced in concrete house construction. They know local conditions and can tell you about plans and costs. Take your plans or sketches to an architect. Have him show you how your home—of any size, style or floor plan—can be economically built with concrete walls, subfloors and firesafe roof.
Architect-Designed Houses Stay Young Longer

Make Your Plant the Headquarters for *CONCRETE MASONRY CONSTRUCTION*

Every month Portland Cement Association advertisements in America's leading home and farm magazines carry sales messages telling millions of prospective buyers about the advantages of concrete masonry construction. Most of these advertisements include a special message like the ones above—advising the prospective customer to call on you, the local concrete masonry manufacturer, for names of builders, engineers or architects familiar with concrete masonry construction.

This advertising helps identify your plant as the headquarters for concrete masonry construction in your community. Giving prospects information about concrete masonry construction and referring them to local architects and contractors who design and build quality concrete masonry structures is one of the best ways to protect your present business and to ensure your future markets.

PORTLAND CEMENT ASSOCIATION

33 W. Grand Avenue, Chicago 10, Illinois

A national organization to improve and extend the uses of portland cement and concrete . . . through scientific research and engineering field work

with an *Erickson*

POWER LIFT TRUCK

Doubled Our Yard Capacity—"Four million blocks is a lot for one lift truck to handle in a yard that is anything but level," writes a user. "So we decided we needed another. Then this year we purchased a third Erickson, your high lift tilt style truck. In the short time that we have had it, this truck has more than paid for itself. It has about doubled the capacity of our yard and is a great help in picking up cubes as well as loading trucks."

Each Erickson Fork or Platform Truck is custom built to meet your particular needs. *Write for our circular.*

Erickson POWER LIFT TRUCKS, Inc.

1403 Marshall Street N. E. • Minneapolis 13, Minnesota

For Efficient, Economical Operation

INVESTIGATE

MULTI-MIXER CORE SAND MIXERS
Completely Automatic

MULTICO BLOCK MAKING MACHINES
Completely Automatic

MULTIPLEX MACHINERY CORP.
ELMORE, OHIO

Color in Concrete

The easily dispersible, non-floating, permanent, qualities of these extra strong colors produce intense shades in concrete.

Special blends in ton lots at no additional charge. Working samples furnished.

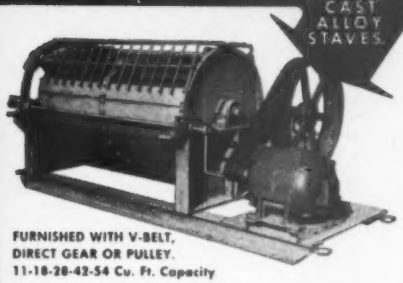
629 W. Washington Blvd.
Chicago, Illinois

1261 Broadway
New York,1 N. Y.

MINERAL PIGMENTS CORP., MUIRKIRK, MD.

NO SHUT-DOWN WITH
DODSON-McCORD MIXERS

CAST ALLOY STAVES



FURNISHED WITH V-BELT, DIRECT GEAR OR PULLEY.
11-18-28-42-54 Cu. Ft. Capacity

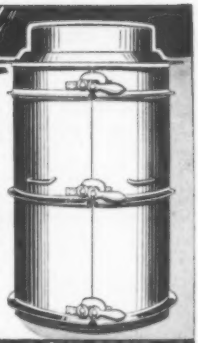
Continuous operation is never a hazard with the Dodson-McCord Concrete Mixer. The Drum is made of interchangeable staves. All wearing parts are stocked at convenient points. Also popular with foundries and in feed, glass, ceramics and fertilizer industries.

DODSON SKIP HOIST - - -

Dodson Skip Hoist eliminates most labor in material handling and speeds up production. Write for descriptive literature on Skip Hoist and Mixer.

DODSON MANUFACTURING CO., INC.
MACHINERY DIVISION
1463 BARWISE - WICHITA 2, KANSAS

THE "Quinn Standard" FOR CONCRETE PIPE



The Quinn Standard is known as the best the world over, wherever concrete pipe is produced and used. Backed by over 35 years' service in the hands of hundreds of Quinn-educated contractors, municipal departments and pipe manufacturers who know from experience that **Quinn pipe forms** and **Quinn mixing formulas** combine to produce the finest concrete pipe at lowest cost.

QUINN HEAVY DUTY PIPE FORMS

For making pipe by hand methods by either the wet or semi-dry processes. Built to give more years of service—sizes for pipe from 10" up to 120" and larger—tongue and groove or bell end pipe at lowest cost.

WRITE TODAY. Complete information, prices, and estimates sent on request.

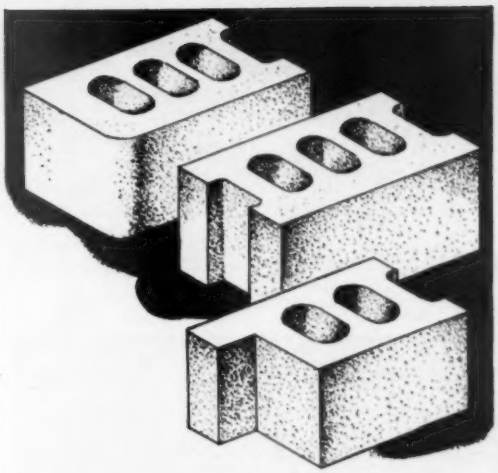
Also manufacturers QUINN CONCRETE PIPE MACHINES

QUINN WIRE & IRON WORKS 1627 12TH ST. BOONE, IA

Advertise Your

"Wants" and

Surplus Equipment



You wouldn't use
THE SAME MOULD
for ALL blocks

Reg. U.S. Pat. Off.

Use the same mould for all types and sizes of concrete block? Ridiculous you say? And it's just as ridiculous to make all block and other concrete products with the same cement! Particularly so when you can use

MEDUSA SPECIAL CEMENTS

that will give you a better product that sells at a better price.

Consider for a moment—with Medusa Waterproofed Gray Portland Cement, you can make a water repellent concrete product. With Medusa White Portland Cement, you can turn out products in white, or you can use a Waterproofed White Cement, and those same products would be waterproofed. These are just three of many instances of how you can improve your products through the use of Medusa Special "Job-Fitted" Cements. The complete story is told in the booklet, "Better Concrete Products." If you haven't read this book, by all means send for it today. It's sent free. All you need to do is fill out the coupon below and send it in at once.

SEND FOR FREE Booklet TODAY

MEDUSA PORTLAND CEMENT CO.
1036-3 Midland Building • Cleveland 15, Ohio

Gentlemen: Please send me a copy of your booklet, "Better Concrete Products."

Name .....

Address .....

City ..... *State* .....

Getting down to Model "K" cases

"The first Lift Truck to meet our requirements in the Plant!"

Concrete products manufacturer reports on HydroLectric "K" Lift Truck

CASE DATA

Efficiency: "Very satisfactory"
Downtime: "None, since purchased in Dec. 1948"
Manpower Saved: "Two Men"

"We are more than satisfied" with the Hydrolectric 'K,' reports the Ritter Concrete Block Co., Cincinnati. Used in moving loaded block racks into kilns, and bringing empty racks to block machine, this Model 'K' has a special 36 in. square platform for side handling. It eliminates the need for transfer cars, frees two men for productive work.

Let Stuebing engineers show you how the Hydrolectric 'K' fits your handling need. For details write for Bulletin "T."

Stuebing Engineered

the Hydrolectric 'K' includes such features as differential gear drive, sealed in lubricant, slashing maintenance and downtime costs.

LIFT TRUCKS INCORPORATED

2425 SPRING GROVE AVE. • CINCINNATI 14, OHIO

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Another Leader IN THE CONCRETE PRODUCTS INDUSTRY PREFERS BESSER VIBRAPACS!

★ This is the 79th of a series of advertisements featuring some of the leaders of the Concrete Products Industry who are today stepping up block production with Besser Super Vibrapacs. Other leaders will be featured subsequently.

The modern plant of Smith Concrete Products, Inc., located on a 5 acre track on U. S. Highway 70, near Kinston, N. C.

"I Wouldn't Sell Any Other Block"

— Says President C. Kersey Smith

Smith Concrete Products, Inc., of Kinston, North Carolina, has been a Besser Super Vibrapac Operator for several years. The rapid growth of this company is due to its splendid high-speed production facilities and aggressive merchandising methods. Newspapers, signs, booklets and direct mail are used extensively for advertising Vibrapac Concrete Masonry Units. President C. Kersey Smith is proud of his products, which he sells under the trade-name VITA-LITE. Crushed stone, sand and Waylite are used for aggregate.

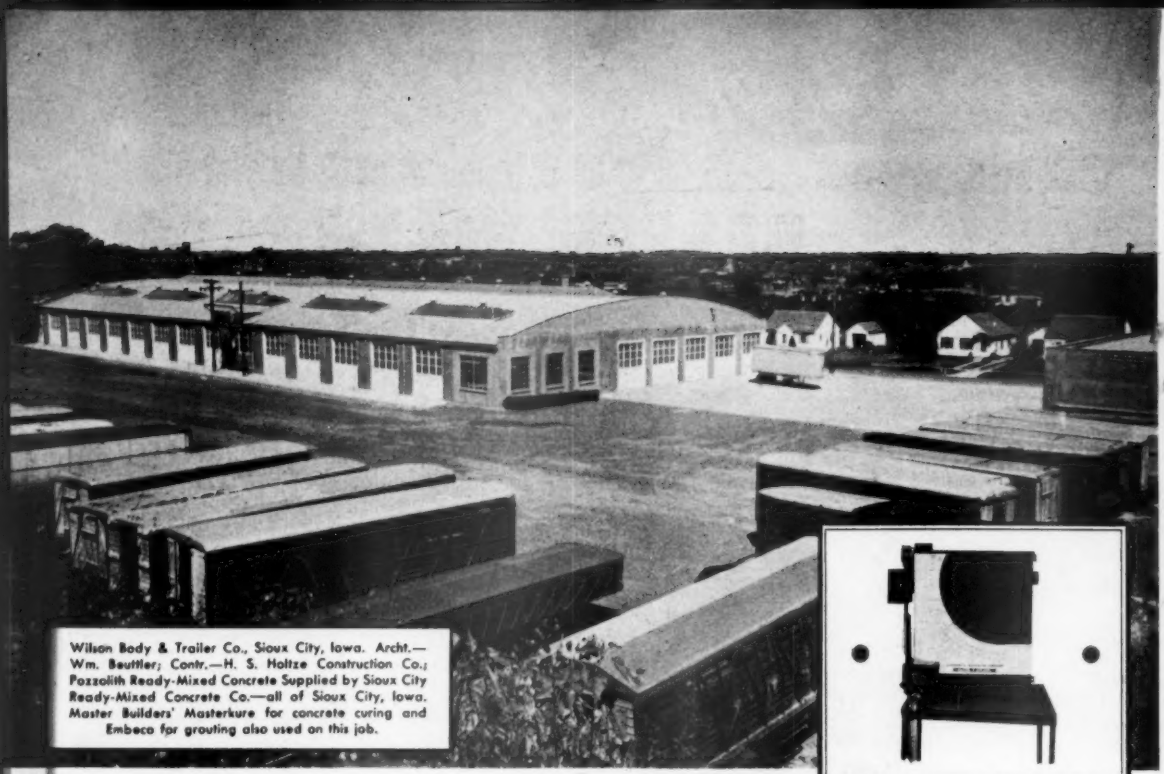
BESSER MANUFACTURING CO.
Complete Equipment for Concrete Products Plants
120-49TH STREET, ALPENA, MICHIGAN, U. S. A.

C. Kersey Smith, President, discussing Vibrapac block production with plant superintendent, John F. Kelly, Mr. Smith says "I wouldn't sell any other block."

Interior view of the Smith plant. Shows Besser Super Vibrapac in operation. Fully automatic. No machine operator is required. All sizes of units produced on this machine using the same set of Plain Pallets.

ONE SET of PLAIN PALLETS for ALL SIZES of UNITS

BESSER Super VIBRAPAC



Wilson Body & Trailer Co., Sioux City, Iowa. Archt.—Wm. Beuttler; Contr.—H. S. Holtze Construction Co.; Pozzolith Ready-Mixed Concrete Supplied by Sioux City Ready-Mixed Concrete Co.—all of Sioux City, Iowa. Master Builders' Masterkure for concrete curing and Embeco for grouting also used on this job.

Modern, Functionally Designed Plant

Built with POZZOLITH READY-MIXED CONCRETE

Easy placeability, good cohesiveness and *assured strength* were obtained in the construction of this modern plant with Pozzolith added with the Master Builders' dispenser. Other advantages resulting from the use of Pozzolith Ready-Mixed Concrete:

1. EASY, ACCURATE CONTROL
2. MINIMIZED SHRINKAGE
3. REDUCED PERMEABILITY
4. GOOD APPEARANCE
5. ECONOMY

Over 400 leading ready-mixed plants in all parts of the country are producing Pozzolith Concrete — and many top design engineers are specifying it — for the same reasons.

Write for full information.

POZZOLITH AUTOMATIC DISPENSER

Operator delivers the correct amount of Pozzolith, in liquid form, required for a batch, by simply setting the control dial and opening valve.

OVER 400 LEADING READY-MIXED PLANTS ARE NOW EQUIPPED WITH THIS DEVICE . . .

WHY?

Because a producer can, at lower cost:

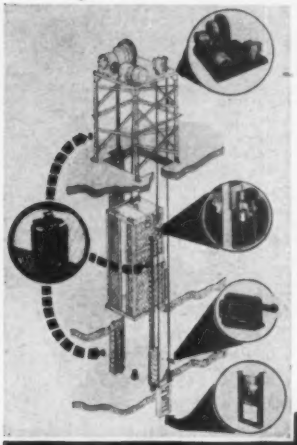
1. Produce waterproof concrete . . . with normal Portland cement.
2. Produce high-early strength concrete . . . with normal Portland cement.
3. Produce air entrained concrete without strength loss . . . with normal Portland cement.
4. Produce all of the above properties out of one cement bin . . . with normal Portland cement — stepping up production, reducing inconvenience in handling and cutting costs.

In normal mixes, concrete of any given durability, strength and workability, is produced more economically with Pozzolith than with any other material on the market, added at the mixer or inter-ground.

the MASTER BUILDERS Co.

CLEVELAND 3, OHIO — TORONTO, ONTARIO

save time . . . save money with EHRSAM ELECTRIC MANLIFTS



Rapid, inter-floor transportation for your employees means more productive time. More production means more profit. Time is saved and your money is saved. Illustrated here is the electric operated, cage-type manlift made in 300 lb. and 500 lb. capacity. Other types available. Reasonable installation costs bring you real savings. Write today for complete information.

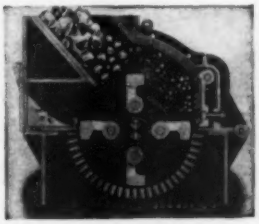
THE J. B. EHRSAM & SONS
MANUFACTURING COMPANY
ENTERPRISE, KANSAS

For Cost Reduction on Material Reduction...

WILLIAMS' "HEAVY-DUTY" HAMMERMILLS

Built to take 6" feed and reduce to agricultural limestone, ¾" stone and other small sizes in *one operation!* Crushing occurs on unusually heavy breaker and grinding plate before reaching grate. This permits grates to be used for sizing only, minimizing wear. The result; more output, more quickly reduced at less operating cost.

Sectional view of Williams "Heavy-Duty" hammermill, with heavy liners and grinding plate for limestone and other hard material. Particular attention is directed to the grinding plate adjustment which assures uniform close contact of hammers and grinding plate at all times. Also note the metal trap which provides an outlet for the escape of tramp iron.



WILLIAMS ALSO MAKES...
Heavy-duty hammermills in smaller sizes for all quarry operations; impact and roller mills for 200 to 325 mesh grinding; drier mills; air separators; vibrating screens; steel bins; complete "packaged" crushing and grinding plants.

WILLIAMS PATENT CRUSHER AND PULVERIZER CO.
802 ST. LOUIS AVE. ST. LOUIS 6, MO.

WC49-4

WILLIAMS
CRUSHERS GRINDERS SHREDDERS

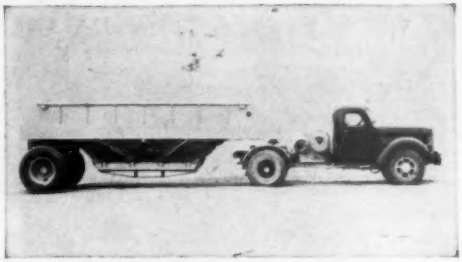
Flexco HD Fasteners make a tight, butt joint of great strength and durability . . . distribute the strain uniformly. Operate smoothly over flat, crowned or take-up pulleys. Made of steel, Monel, Everdur and Promal.

Flexco Rip Plates are for repairing and patching damaged belts.

Ask for Bulletin F-100

FLEXIBLE STEEL LACING COMPANY
4623 Lexington St., Chicago 44, Illinois

Strong, Smooth and Readily Troughing.
Order From Your Supply House



Landis 18 yard off the road wide opening air door. Length 22'9", height 7'9", width 8' overall. Door openings 3'6" by 8' clear. Used for hauling bulky material such as slag, broken stone, etc. Made of ¼" plate, doors of ⅜" plate.

MAKE HAULING EASY

AIR CONTROLS

DUMP LOADS

FASTER

SAFETY WITH SPEED

LANDIS STEEL COMPANY
Picher, Okla.

CALUMET

ALLOY STEEL CASTINGS *for*

- **LONGER WEAR**
- **HIGHEST QUALITY**

CALUMET

SERVICE *for* . . . . . .

- **PROMPT DELIVERY**
- **DEPENDABLE EMERGENCY PRODUCTION**

Our operations assure you of efficient service on every type of order

ALUMETAL

CALUMET STEEL CASTINGS CORP.
1636 SUMMER ST. • HAMMOND, IND.

AT LAST...
A "NON-ELECTRIC" MAGNETIC SEPARATOR PULLEY GUARANTEED TO EQUAL OR EXCEED THE PERFORMANCE OF AN ELECTRO MAGNETIC SEPARATOR PULLEY

IT'S TRUE . . . ONLY HOMER HEAVY-DUTY Permanent "non-electric" Magnetic Pulleys are guaranteed to equal or exceed the performance of electro magnetic pulleys of same size and capacity.
HOMER Heavy-Duty Pulleys available in standard diameters from 12" to 30", with belt widths from 4" to 60". Write for descriptive data.

Homer **The HOMER MANUFACTURING CO., Inc.**
DEPT. I-52 LIMA, OHIO

Producers of Magnetic Separator Equipment Since 1923

PLATEGRIP
REPAIR PLATE

for mending and patching heavy conveyor belts

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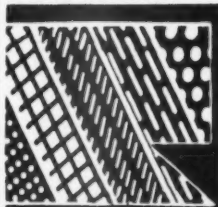

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Will accept any reasonable offer.
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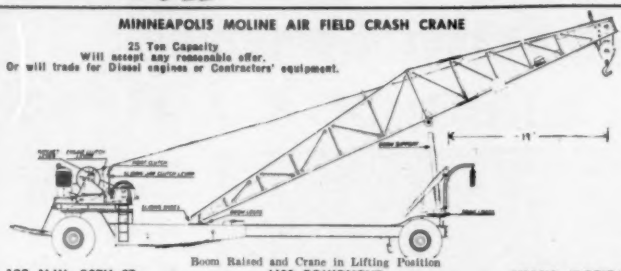

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1—Ohio Model F 30 ton diesel powered new 1946, double drums, Caterpillar diesel unit.
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10 complete open and closed elevators
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1 Plymouth gas locomotive, 35-ton, 6 wheel.

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All steel dredge boats, tug boats and pug boat
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1—50 ton American Model 20-100 all steel guy derrick, Ser. No. 1184, with 115' mast, 100' boom, 16' bullwheel. Capacity 50 tons at 38' and 20 tons at 98' radius.

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½ yd. Universal Crane #873, with 25' boom, mtd. on 10 wheel Hendrickson pneu. tired truck.

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1—35 ton Ohio, Mdl. G, ser. No. 3950, boom 50', ASME boiler, cast steel trucks, outriggers.

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1—REX PUMPCRETE, Model 160 Double, Completely Overhauled. Gasoline Engine Driven, Latest Model Machine with Selective Drive Transmission, with approximately 1,000 lin. ft. 7" Pipe.

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1—Cedar Rapids 72" x 24' Sand Settling Drag Tank Scraper complete w/ reduction drive arrangement and 10 HP electric motor complete with magnetic starter.

Priced at 50% of new price delivered to purchaser.

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Each Unit Overhauled

K-55 Link Belt Electric Shovel
2 yd. Shovel & Dragline Front
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5' Dia. x 8' Air Swept Tube Mill
Complete with Motors, Fans & Pipe

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Baughman under-track limestone conveyor and 24 foot steel flight limestone elevator with Wisconsin engines, portable slightly used on 4-6:00x16 tires. Inquire **FULLER SEED CO., Lincoln, Illinois.**

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Worthington two-stage, water cooled, vertical 250#, 60 CFM, new condition.

Gardner-Denver, 105 foot, with air receiver, hose reel, driven by power take-off and mounted 1941 Ford.

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Pennsylvania 12" x 10" class 3A single cylinder, 355 cubic foot P.D., flat belt driven, 50 HP slip ring motor.

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30"	5	1/8" – 1/16"
26"	5	1/8" – 1/32"
24"	5	1/8" – 1/32"
24"	4	1/8" – 1/32"
20"	5	1/8" – 1/32"
20"	4	1/8" – 1/32"
18"	4	1/8" – 1/32"
16"	4	1/8" – 1/32"
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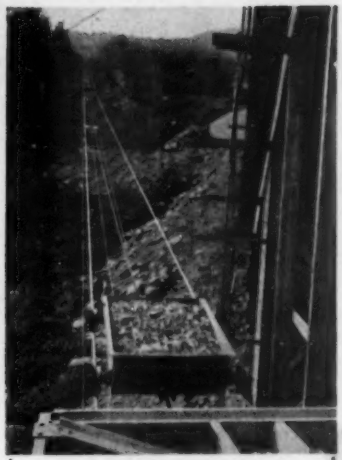

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Powered by 6 cyl. Buick motor (29), thoroughly overhauled. Plenty of power.

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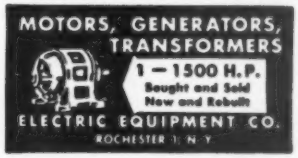

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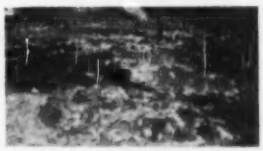

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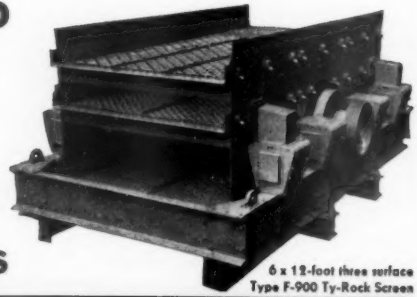

6 x 12-foot three surface Type F-900 Ty-Rock Screen

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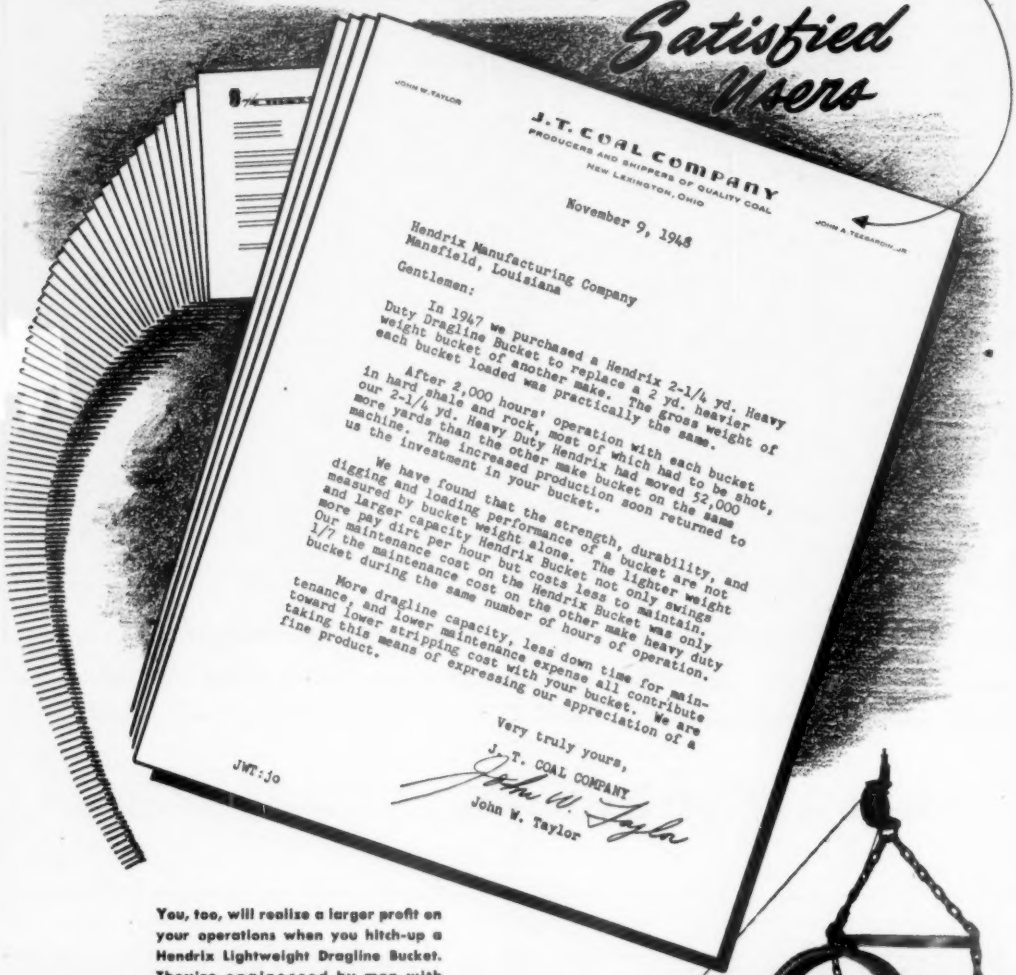

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November 9, 1948

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J. T. COAL COMPANY
John W. Taylor
John W. Taylor

JWT:jo

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HENDRIX *Lightweight* **DRAGLINE BUCKETS**

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IN gets secondary coral rock
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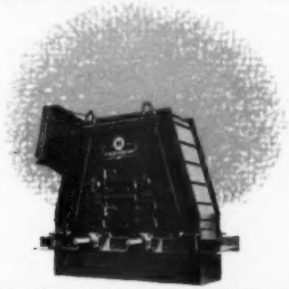

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NEW HOLLAND MANUFACTURING COMPANY, MOUNTVILLE, PA.

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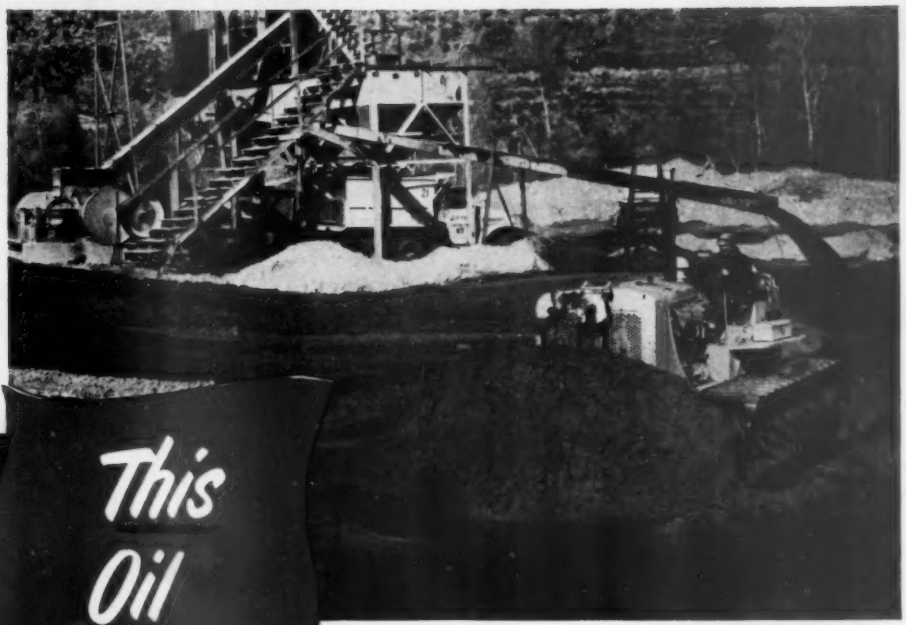

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